

104-1811CLDNA(B)

PC/104-Plus 单板电脑

Embedded 104 Single Board
Computer

Version: A0

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安全使用小常识

1. 产品使用前，务必仔细阅读产品说明书；
2. 对未准备安装的板卡，应将其保存在防静电保护袋中；
3. 在从防静电保护袋中拿出板卡前，应将手先置于接地金属物体上一会儿（比如 10 秒钟），以释放身体及手中的静电；
4. 在拿板卡时，需佩戴静电保护手套，并且应该养成只触及边缘部分的习惯；
5. 为避免人体被电击或产品被损坏，在每次对主板、板卡进行拔插或重新配置时，须先关闭交流电源或将交流电源线从电源插座中拔掉；
6. 在需对板卡或整机进行搬动前，务必先将交流电源线从电源插座中拔掉；
7. 对整机产品，需增加 / 减少板卡时，务必先拔掉交流电源；
8. 当您需连接或拔除任何设备前，须确定所有的电源线事先已被拔掉；
9. 为避免频繁开关机对产品造成不必要的损伤，关机后，应至少等待 30 秒后再开机。

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第一章 产品介绍

简介

该产品是一款高性能、低功耗，工业级，嵌入式PC104主板，采用低功耗、高性能的Intel® Atom™ N270处理器及Mobile Intel® 945GSE + ICH7M 芯片组设计，主板最大功耗控制在12W以内（含CF卡、1G板载内存）。此产品具有稳定、安全、可靠、实用性强等特点，可广泛应用于军工、医疗、数控、通讯、交通等领域。

机械尺寸、重量与环境

- 外形尺寸：115.6mm（长）×103.1mm（宽）×23.2mm（高）
- 净重：0.24Kg；
- 工作环境：
 - 温度：-20℃~+70℃；
 - 湿度：5%~90%（非凝结状态）；
- 贮存环境：
 - 温度：-40℃~+85℃；
 - 湿度：5%~90%（非凝结状态）。

典型功耗

CPU：板载 Intel® Atom™ 1.6G

内存：板载 1G DDR2 533MHz

- +5V@2.24A；+5%/-3%；

微处理器

Intel® Atom™ N270 1.6G/533MHz/512k/FCBGA8-437 CPU。

芯片组

Intel® 945GSE + ICH7M

系统存储器

板载1G DDR2 533MHz 内存。

显示功能

采用Mobile Intel® 945GSE芯片组集成显示模块，根据需要分配显示内存，支持VGA显示，双通道的LVDS显示(18bit)和VGA+LVDS双显示功能。

网络功能

提供1个10/100/1000Mbps以太网接口，提供高速稳定的网络平台选择。

电源特性

采用AT电源单5V供电。

扩展总线

支持标准PC/104和PC/104-Plus扩展总线。

AUDIO 功能

主板集成1个双声道HD声卡，支持Mic-in/Line-in/Speaker-out。

IDE 功能

1个44Pin IDE硬盘接口和1个TYPE1 CF卡接口；2个SATA 接口。

I/O 功能

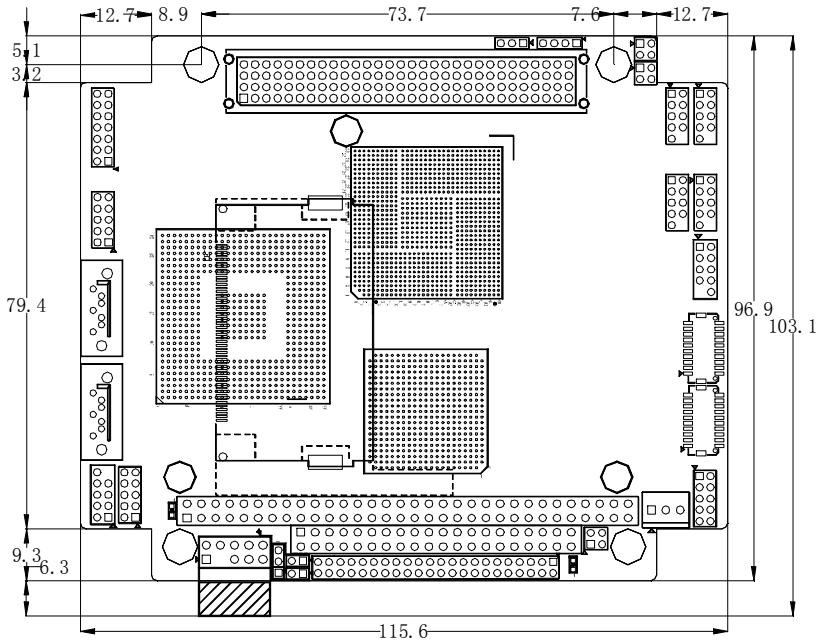
- 2个USB2.0接口，可同时支持4个USB设备。
- 4个串口，COM1和COM2支持RS232模式，COM3和COM4支持RS422/RS485模式；
- 1个可编程数字I/O接口（四输入和四输出）。

Watchdog 功能

- 255级，可编程按秒；
- 超时中断或系统复位。

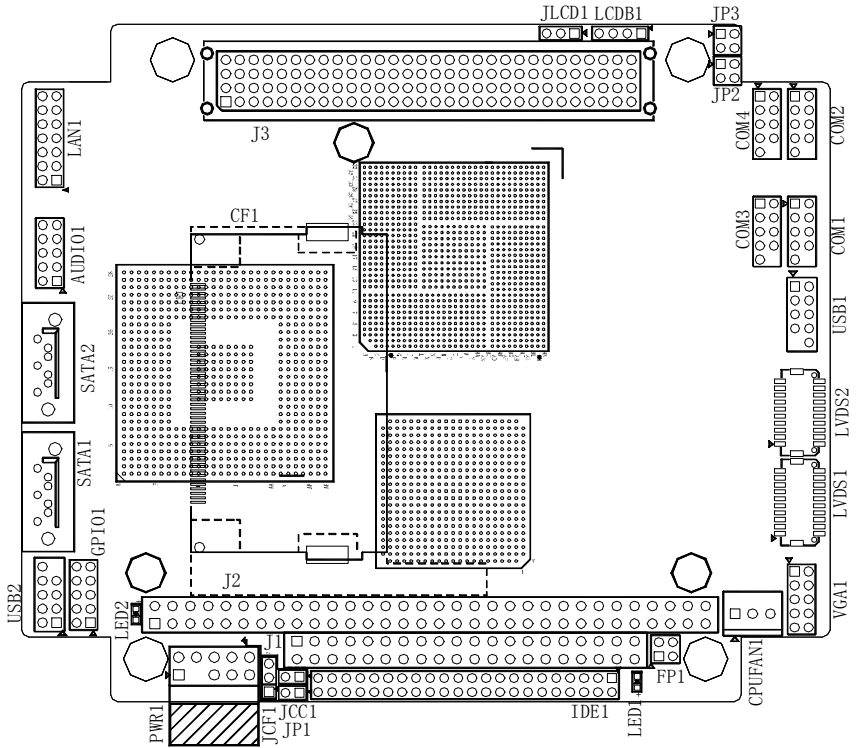
第二章 安装说明

产品外形尺寸图

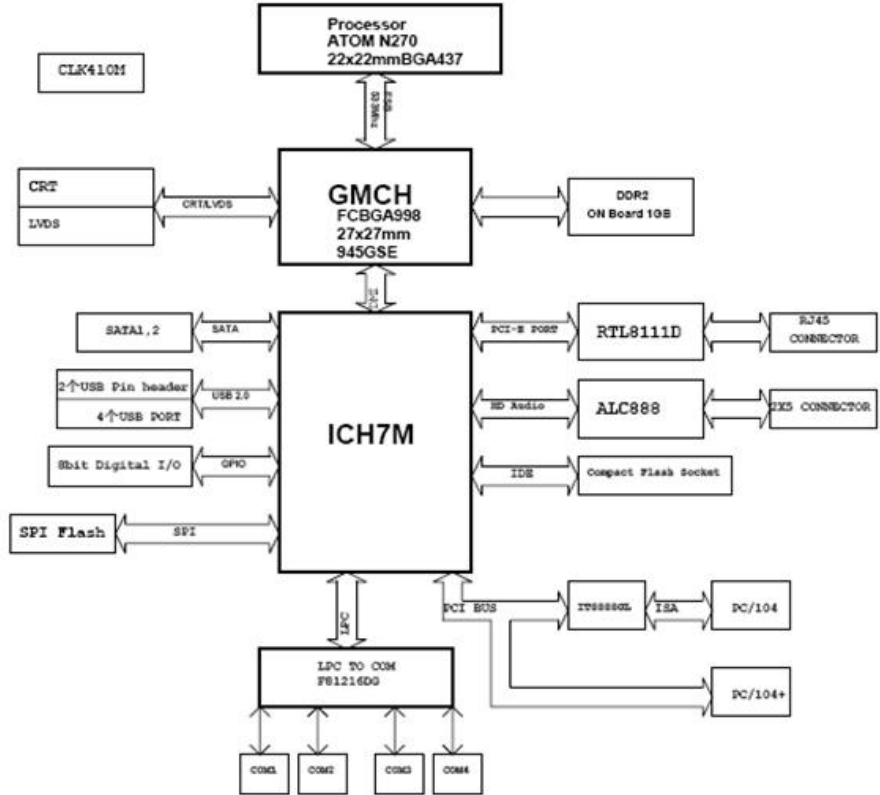


(单位: mm)

接口位置示意图




主板框架图



跳线功能设置

1. JCC1:CMOS内容清除/保持设置 (脚距2.0mm)

CMOS由板上钮扣电池供电。清CMOS会导致永久性消除以前系统配置并将其设为原始(工厂设置)系统设置。其步骤:(1)关闭计算机,断开电源;(2)瞬间短接JCC1焊盘;(3)开计算机;(4)启动时按屏幕提示进入BIOS设置,重载最优缺省值;(5)保存并退出设置。



JCC1

设置	功能
1-2 开路	正常工作状态(Default)
1-2 短路	清除 CMOS 内容, 所有 BIOS 设置恢复成出厂值。

2. CF卡主从选择 (脚距2.0mm)



JP1

设置	功能
1-2 短路	Master
1-2 开路	Slave(Default)

3. 串口RS-422/485模式选择 (脚距2.0mm)

串口COM3, COM4只支持RS-422/RS-485传输模式,可分别通过设置JP2, JP3来实现COM3, COM4的模式选择:

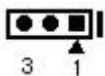


JP2, JP3

管脚设置	模式选择	
	RS-485(Default)	RS-422
JP2	1-2 短路	3-4 开路
JP3	1-2 开路	3-4 短路

4. LCD工作电压选择 (脚距2.0mm)

不同的LCD屏电压可能不同,本板提供了3.3V和5V两种电压选择,当所选择的LCD电压与所使用的LCD屏的工作电压一致时,LCD屏才能正常显示。



JLCD1

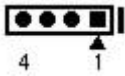
设置	功能
1-2 短路	+3.3V(Default)
2-3 短路	+5V

5. CF卡电压选择（脚距2.0mm）



设置	功能
1-2 短路	+3.3V
2-3 短路	+5V(Default)

LCD 背光控制接口



LCDB1
(脚距2.0mm)

管脚	信号名称
1	VCC12
2	LCD_BKLTCTL
3	LCD_BKLTEN
4	GND

注： VCC12——背光电源（电源电压由背光电压选择跳线控制）
LCD_BKLTCTL——背光控制； LCD_BKLTEN —— 背光使能

SATA 接口

本板提供2个SATA接口。

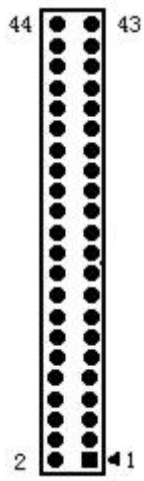


SATA1, SATA2

管脚	信号名称
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

IDE 接口

本板提供1个IDE接口，安装IDE设备时，需注意以下几点： IDE接口只连接1台IDE设备。主板上提供相应的跳线来将其配置成主设备还是从设备使用。当IDE为主设备（Master）时，CF卡为从设备，反之CF卡为主设备。



IDE1
(脚距 2.0mm)

管脚	信号名称	管脚	信号名称
1	RESET#	2	GND
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	GND	20	Key
21	DREQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	IORDY	28	GND
29	DACK#	30	GND
31	IRQ	32	NC
33	DA1	34	ATA66_DET
35	DA0	36	DA2
37	CS1#	38	CS3#
39	LED#	40	GND
41	+5V	42	+5V
43	GND	44	GND

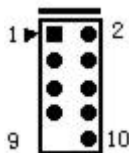
CF 卡

Compact Flash卡是一种快速存储器，体积很小，使用方便，存储量随使用的卡变化，如128M，256M等。CF卡插入时只能以一个方向插入，板上标识为CF1，在板背面。

管脚	信号名称	管脚	信号名称
1	GND	26	CD1#
2	D3	27	D11
3	D4	28	D12
4	D5	29	D13
5	D6	30	D14
6	D7	31	D15
7	CS0#	32	CS1#
8	GND	33	VS1#
9	ATASEL#	34	IOR#
10	GND	35	IOW#
11	GND	36	WE#
12	GND	37	IRQ
13	VCC	38	VCC
14	GND	39	CSEL#
15	GND	40	VS2#
16	GND	41	RESET#
17	GND	42	IORDY
18	A2	43	DREQ
19	A1	44	DACK#
20	A0	45	DASP#
21	D0	46	ATA66_DET
22	D1	47	D8
23	D2	48	D9
24	WP/IOCS16#	49	D10
25	CD2#	50	GND

USB 接口

本板提供2组USB接口（脚距2.0mm），可连接4个标准的USB设备。



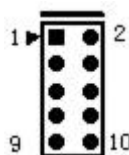
USB1, USB2

管脚	信号名称	管脚	信号名称
1	+5V	2	+5V
3	USB1_Data-	4	USB2_Data-
5	USB1_Data+	6	USB2_Data+
7	GND	8	GND
9	NC	10	GND_CHASSIS

显示接口

1. 10Pin插针VGA接口（脚距2.0mm）

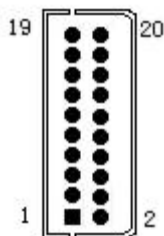
需要用转接线接标准VGA设备，其接口定义如下：



VGA1

管脚	信号名称	管脚	信号名称
1	VSYNC	2	HSYNC
3	DDCDATA	4	Red
5	DDCCLK	6	Green
7	+5V	8	Blue
9	GND	10	GND

2. 双通道(18bit)LVDS接口（脚距1.0mm）



LVDS1, LVDS2

管脚	信号名称	管脚	信号名称
1	LVDS_D0+	2	LVDS_D0-
3	GND	4	GND
5	LVDS_D1+	6	LVDS_D1-
7	GND	8	GND
9	LVDS_D2+	10	LVDS_D2-
11	GND	12	GND
13	CLK+	14	CLK-
15	GND	16	GND
17	NC	18	NC
19	VDD	20	VDD

注：为兼容分辨率为640×480的LVDS屏，BIOS里面的默认设置为640×480；当使用VGA或高分辨率LVDS屏时请务必在CMOS下设置为800×600或更高的分辨率，设置方法请参照BIOS设置指南。

LED 灯



LED1, LED2

LED	功能
LED1	硬盘指示灯
LED2	电源指示灯

多功能接口



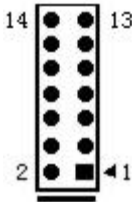
FP1

(脚距 2.0mm)

管脚	信号名称	管脚	信号名称
1	SPEAK-	2	+5V
3	RESET	4	GND

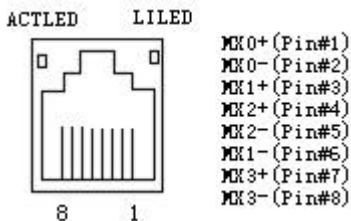
网络接口

本板提供1组10/100/1000Mbps网络接口（LAN1，脚距2.0mm），需要用转接线固定到机箱上与外部设备连接，以下给出它的管脚定义：



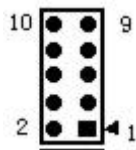
LAN1

管脚	信号名称	管脚	信号名称
1	MX0	2	MX0-
3	MX1+	4	MX1-
5	MX2+	6	MX2-
7	MX3+	8	MX3-
9	GND	10	GND
11	LINK_LED+	12	LINK_LED-
13	ACT_LED+	14	ACT_LED-



ACTLED (单色: 绿色灯)	网络活动 指示状态	LILED (双色: 黄/绿灯)	
		网络速度 指示状态	
		绿色	1000Mbps
闪烁	有数据传输	黄色	100Mbps
灭	无数据传输	灭	10Mbps

音频接口



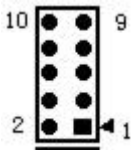
AUDIO1

(脚距: 2.0mm)

管脚	信号名称	管脚	信号名称
1	LOUT_R	2	LOUT_L
3	AGND	4	AGND
5	LIN_R	6	LIN_L
7	AGND	8	AGND
9	MIC_L	10	MIC_R

数字 I/O 接口

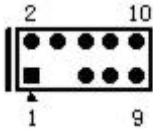
主板提供四路输入、四路输出的GPIO接口（脚距：2.0mm）。



GPIO1

管脚	信号名称	管脚	信号名称
1	INPUT0	2	OUTPUT0
3	INPUT1	4	OUTPUT1
5	INPUT2	6	OUTPUT2
7	INPUT3	8	OUTPUT3
9	GND	10	NC

电源接口

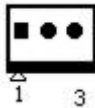


PWR1

(脚距 2.54mm)

管脚	信号名称	管脚	信号名称
1	GND	2	+5V
3	NA	4	+12V
5	NC	6	NC
7	GND	8	+5V
9	GND	10	+5V

风扇接口



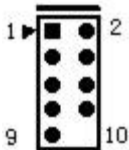
CPUFAN1

(脚距 2.54mm)

管脚	信号名称
1	GND
2	+5V
3	NC

串口

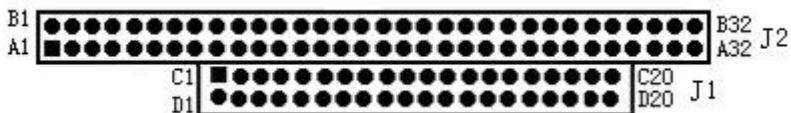
本主板提供4个2x5Pin插针式的串行通讯口，需要用转换电缆固定到机箱上才能与外部设备连接。其中COM1和COM2支持RS-232模式，COM3和COM4支持RS-422/RS-485可选。（脚距2.0mm）



COM1~COM4

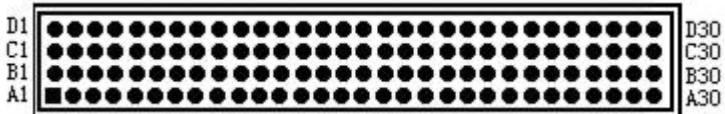
管脚	信号名称 (COM1, COM2)	信号名称 (COM3, COM4)	
	RS-232	RS-422	RS-485
1	DCD#	TXD-	Data-
2	RXD	TXD+	Data+
3	TXD	RXD+	X
4	DTR#	RXD-	X
5	GND	GND	GND
6	DSR#	X	X
7	RTS#	X	X
8	CTS#	X	X
9	RI#	X	X
10	NA	NA	NA

PC/104 接口



管脚	信号名称	管脚	信号名称	管脚	信号名称	管脚	信号名称
A1	IOCHCK#	B1	GND	C1	GND	D1	GND
A2	SD7	B2	RESET	C2	SBHE#	D2	MEMCS16#
A3	SD6	B3	+5V	C3	LA23	D3	IOCS16#
A4	SD5	B4	IRQ9	C4	LA22	D4	IRQ10
A5	SD4	B5	-5V	C5	LA21	D5	IRQ11
A6	SD3	B6	DRQ2	C6	LA20	D6	IRQ12
A7	SD2	B7	-12V	C7	LA19	D7	IRQ15
A8	SD1	B8	SRDY#	C8	LA18	D8	IRQ14
A9	SD0	B9	+12V	C9	LA17	D9	DACK0#
A10	IOCHRDY	B10	KEY	C10	MEMR#	D10	DRQ0
A11	AEN	B11	SMEMW#	C11	MEMW#	D11	DACK5#
A12	SA19	B12	SMEMR#	C12	SD8	D12	DRQ5
A13	SA18	B13	IOW#	C13	SD9	D13	DACK6#
A14	SA17	B14	IOR#	C14	SD10	D14	DRQ6
A15	SA16	B15	DACK3#	C15	SD11	D15	DACK7#
A16	SA15	B16	DRQ3	C16	SD12	D16	DRQ7
A17	SA14	B17	DACK1#	C17	SD13	D17	+5V
A18	SA13	B18	DRQ1	C18	SD14	D18	MASTER#
A19	SA12	B19	REFRESH#	C19	SD15	D19	GND
A20	SA11	B20	BCLK	C20	KEY	D20	GND
A21	SA10	B21	IRQ7				
A22	SA9	B22	IRQ6				
A23	SA8	B23	IRQ5				
A24	SA7	B24	IRQ4				
A25	SA6	B25	IRQ3				
A26	SA5	B26	DACK2#				
A27	SA4	B27	TC				
A28	SA3	B28	BALE				
A29	SA2	B29	+5V				
A30	SA1	B30	OSC				
A31	SA0	B31	GND				
A32	GND	B32	GND				

PC/104 Plus 插槽



J3

管脚	信号名称	管脚	信号名称	管脚	信号名称	管脚	信号名称
A1	KEY	B1	NC	C1	+5V	D1	AD0
A2	NC	B2	AD2	C2	AD1	D2	+5V
A3	AD5	B3	GND	C3	AD4	D3	AD3
A4	C/BE0#	B4	AD7	C4	GND	D4	AD6
A5	GND	B5	AD9	C5	AD8	D5	GND
A6	AD11	B6	NC	C6	AD10	D6	NC
A7	AD14	B7	AD13	C7	GND	D7	AD12
A8	+3.3V	B8	C/BE1#	C8	AD15	D8	+3.3V
A9	SERR#	B9	GND	C9	NC	D9	PAR
A10	GND	B10	PERR#	C10	+3.3V	D10	NC
A11	STOP#	B11	+3.3V	C11	PLOCK#	D11	GND
A12	+3.3V	B12	TRDY#	C12	GND	D12	DEVSEL#
A13	FRAME#	B13	GND	C13	IRDY#	D13	+3.3V
A14	GND	B14	AD16	C14	+3.3V	D14	C/BE2#
A15	AD18	B15	+3.3V	C15	AD17	D15	GND
A16	AD21	B16	AD20	C16	GND	D16	AD19
A17	+3.3V	B17	AD23	C17	AD22	D17	+3.3V
A18	IDSEL0	B18	GND	C18	IDSEL1	D18	IDSEL2
A19	AD24	B19	C/BE3#	C19	NC	D19	IDSEL3
A20	GND	B20	AD26	C20	AD25	D20	GND
A21	AD29	B21	+5V	C21	AD28	D21	AD27
A22	+5V	B22	AD30	C22	GND	D22	AD31
A23	REQ0#	B23	GND	C23	REQ1#	D23	NC
A24	GND	B24	REQ2#	C24	+5V	D24	GNT0#
A25	GNT1#	B25	NC	C25	GNT2#	D25	GND
A26	+5V	B26	CLK0	C26	GND	D26	CLK1
A27	CLK2	B27	+5V	C27	CLK3	D27	GND
A28	GND	B28	PIRQD#	C28	+5V	D28	RESET#
A29	+12V	B29	PIRQA#	C29	PIRQB#	D29	PIRQC#
A30	-12V	B30	REQ3#	C30	GNT3#	D30	KEY

第三章 BIOS 功能简介

简介

BIOS (Basic Input and Output System: 基本输入输出系统) 固化在 CPU 板上的闪存存储器中, 主要功能包括: 初始化系统硬件, 设置各系统部件的工作状态, 调整各系统部件的工作参数, 诊断系统各部件的功能并报告故障, 给上层软件系统提供硬件操作控制接口, 引导操作系统等。BIOS 提供用户一个菜单式的人机接口, 方便用户配置各系统参数设置, 控制电源管理模式, 调整系统设备的资源分配等等。

正确设置 BIOS 各项参数, 可使系统稳定可靠地工作, 同时也能提升系统的整体性能。不适当的甚至错误的 BIOS 参数设置, 则会使系统工作性能大为降低, 使系统工作不稳定, 甚至无法正常工作。

BIOS 参数设置

每当系统接通电源, 正常开机后, 便可看见进入 BIOS 设置程序提示的信息。此时(其它时间无效), 按下提示信息所指定的按键(通常为键)即可进入 BIOS 设置程序。

CMOS 中 BIOS 设置内容被破坏时, 系统也会要求进入 BIOS 设置或选择某种默认设置值。

通过 BIOS 修改的所有设置值都保存在系统的 CMOS 存储器中, 该 CMOS 存储器由电池供电, 即使切断外部电源, 其内容也不会丢失, 除非执行清除 CMOS 内容的操作。

注意! BIOS 的设置直接影响到电脑的性能, 设置错误的参数将造成电脑的损坏, 甚至不能开机, 请清 CMOS 后再使用 BIOS 内置缺省值来恢复系统正常运行。

由于本公司不断研发更新 BIOS, 其设置界面也会略有不同, 以下的画面供您参考, 有可能跟您目前所使用的 BIOS 设置程序不完全相同。

BIOS 基本功能设置

当SETUP程序启动之后，您可以看到CMOS Setup Utility主画面如下：

BIOS SETUP UTILITY	
System Overview	←→ Select Screen ↑ ↓ Select Item + - Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit
Processor Type : Genuine Intel(R) CPU N270 @ 1.60GHz Speed :1600MHz System Memory Size :1016MB System Time [00:47:55] System Date [Wed 01/02/2002]	
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◆ Main

➤ System Time

选择此选项，用< + > / < - >来设置目前的时间。以时/分/秒的格式来表示。各项目合理的范围是：Hour/时(00-23)，Minute/分(00-59)，Second/秒(00-59)。

➤ System Date

选择此选项，用< + > / < - >来设置目前的日期。以月/日/年的格式来表示。各项目合理的范围是：Month/月(Jan. -Dec.)，Date/日(01-31)，Year/年(最大至 2099)，Week/星期(Mon. ~ Sun.)。

◆ **Advanced**

BIOS SETUP UTILITY	
Advanced Settings	Configure CPU
WARNING:Setting wrong values in below sections may cause system to malfunction ▶CPU Configuration ▶IDE Configuration ▶Super I/O Configuration ▶ISA I/O Decode Configuration ▶ISA Memory Decode Configuration ▶USB Configuration ▶Power Management Configuration ▶Clock Generator Configuration	←→ Select Screen ↑ ↓ Select Item Enter Go to Sub Screen Tab Select Field F1 General Help F10 Save and Exit ESC Exit
V02.57 (c)Copyright 1985-2004, American Megatrends, Inc.	

➤ **CPU Configuration**

BIOS SETUP UTILITY	
Configure advanced CPU settings	
Brand String:	
Genuine Intel(TM)2 CPU N270 @1.60GHz	
Frequency; :1.60GHz	←→ Select Screen
FSB Speed; :533MHz	↑ ↓ Select Item
Cache L1; :24 KB	+ - Change Field
Cache L2; :512KB	Tab Select Field
Ratio Actual Value :12	F1 General Help
Hyper Threading Technology [Enabled]	F10 Save and Exit
Intel(R) SpeedStep(tm)tech [Enabled]	ESC Exit
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➤ IDE Configuration

BIOS SETUP UTILITY	
IDE Configuration	
ATA/IDE Configuration	[Enhanced]
Configure SATA as	[IDE]
Configure SATA Channels	[Before PATA]
▶Primary IDE Master	: [Not Detected]
▶Primary IDE Slave	: [Not Detected]
▶Secondary IDE Master	: [Not Detected]
▶Secondary IDE Slave	: [Not Detected]
▶Third IDE Master	: [Not Detected]
▶Third IDE Slave	: [Not Detected]

←→	Select Screen
↑ ↓	Select Item
+ -	Change Field
Tab	Select Field
F1	General Help
F10	Save and Exit
ESC	Exit

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● **ATA/IDE Configuration**

此选项用来配置ATA的工作模式，Enhanced和Compatible分别对应增强模式和兼容模式。

● **Configure SATA as**

SATA控制器的类型选择，对应IDE，RAID和AHCI三个选择项，仅在ATA/IDE Configuration为增强模式时才支持RAID和AHCI。

RAID和AHCI功能同时需要硬件芯片和操作系统支持。

● **Configure SATA Channels**

配置SATA通道类型，对应Before PATA和Behind PATA选择项。

● **Primary~Third IDE Master/Slave**

*** Type**

Not Installed: 系统没有检测到IDE设备

AUTO: 系统开机自动检测IDE参数

CD/DVD: 用于ATAPI CDROM

ARMD: 用于各种模拟IDE设备

*** LBA/Large Mode**

用于设置是否支持LBA模式。

*** Block(Multi-sector Transfer)**

用于设置是否支持多扇区同时传输的功能。

*** PIO Mode**

用于PIO模式设置。

*** DMA Mode**

用于DMA模式设置。

*** S. M. A. R. T**

此选项用于设置是否启用硬盘S. M. A. R. T功能，只对支持该功能的硬盘有效。

*** 32Bit Data Transfer**

此选项用于使能32位的硬盘访问模式，可以使硬盘读写速度达到最佳。

➤ **Super I/O Configuration**

BIOS SETUP UTILITY	
Configure Super I/O Chipset	Allows BIOS to Enable or Disable Floppy Controller.
Serial Port1 Address [3F8]	
Serial Port1 IRQ [4]	
Serial Port2 Address [2F8]	← → Select Screen
Serial Port2 IRQ [3]	↑ ↓ Select Item
Serial Port1 Address [3E8]	+ - Change Field
Serial Port1 IRQ [10]	Tab Select Field
Serial Port2 Address [2E8]	F1 General Help
Serial Port2 IRQ [11]	F10 Save and Exit
	ESC Exit
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● **Serial Port 1-4 Address**

设定主机板上串口1-4的IO地址, 选项有: Disabled、3F8H、3E8、2E8、2F8H。

● **Serial Port 1-4 IRQ**

设定主机板上串口1-4的IRQ资源, 选项有: 3, 4, 10, 11。

➤ **ISA I/O Decode Configuration**

BIOS SETUP UTILITY	
Configure ISA I/O Address	
Decode I/O Space 0	[Enabled]
Decode I/O Base 0	[0100h]
Decode I/O Size 0	[64 Bytes]
Decode I/O Space 1	[Enabled]
Decode I/O Base 1	[0140h]
Decode I/O Size 1	[32 Bytes]
Decode I/O Space 2	[Enabled]
Decode I/O Base 2	[0200h]
Decode I/O Size 2	[128 Bytes]
Decode I/O Space 3	[Enabled]
Decode I/O Base 3	[0300h]
Decode I/O Size 3	[64 Bytes]
Decode I/O Space 4	[Enabled]
Decode I/O Base 4	[0340h]
Decode I/O Size 4	[32 Bytes]
Decode I/O Space 5	[Enabled]
Decode I/O Base 5	[0A70h]
Decode I/O Size 5	[16 Bytes]
	← → Select Screen ↑ ↓ Select Item + - Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit
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● **Decode I/O Space(0-5)**

IO解码空间开关(n)。

● **Decode I/O Base(0-5)**

IO解码空间基地址。

- **Decode I/O Size(0-5)**

I/O解码空间大小。

- **ISA Memory Decode Configuration**

BIOS SETUP UTILITY	
Configuration ISA Memory Address By WB83628	
Memory Space 0	[Disabled]
Decode MEM Base 0	[0000]
Decode MEM Size 0	[16 KB]
Memory Space 1	[Disabled]
Decode MEM Base 1	[0000]
Decode MEM Size 1	[16 KB]
Memory Space 2	[Disabled]
Decode MEM Base 2	[0000]
Decode MEM Size 2	[16 KB]
Memory Space 3	[Disabled]
Decode MEM Base 3	[0000]
Decode MEM Size 3	[16 KB]
←→ Select Screen ↑ ↓ Select Item + - Change Field F1 General Help F10 Save and Exit ESC Exit	
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- **Memory Space(0-3)**

Memory解码空间开关。

- **Decode MEM Base(0-3)**

Memory解码空间基地址。

- **Decode MEM Size(0-3)**

Memory解码空间大小。

➤ **USB Configuration**

BIOS SETUP UTILITY	
USB Configuration	Enables USB host controllers.
USB Devices Enabled :	
1 Keyboard, 1 Drive	
▶USB Mass Storage Device Configuration	←→ Select Screen ↑ ↓ Select Item + - Change Field F1 General Help F10 Save and Exit ESC Exit
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● **USB Mass Storage Device Configuration**

此选项用于配置USB块存储设备，其中包括Reset 延时设置及枚举类型。

➤ **Power Management Configuration**

BIOS SETUP UTILITY	
Power Management Configuration	
ACPI APIC Support [Enabled]	←→ Select Screen ↑ ↓ Select Item + - Change Field F1 General Help F10 Save and Exit ESC Exit
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● **ACPI APIC Support**

此选项用于打开或关闭ACPI OS下的APIC（高级中断控制器）。

➤ **Clock Generator Configuration**

BIOS SETUP UTILITY	
Configure Clock Generator	←→ Select Screen
Spread Spectrum Control [Enabled]	↑ ↓ Select Item
Auto PCI Clock [Enabled]	+ - Change Field
	F1 General Help
	F10 Save and Exit
	ESC Exit
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● **Spread Spectrum Control**

此选项用来控制时钟信号的展频功能。

● **Auto PCI Clock**

此选项用来实现PCI槽上设备的自动侦测，如果槽上无设备，则关闭该槽对应的时钟信号。

◆ **Chipset**

BIOS SETUP UTILITY	
Advanced Chipset Settings	
WARNING: Setting wrong values in below sections may cause system to malfunction.	
North Bridge Chipset Configuration	
DRAM Frequency [Auto]	
Configure DRAM Timing by SPD [Enabled]	
Boots Graphic Adapter Priority [PEG/PCI]	←→ Select Screen
Internal Graphics Mode Select [Enabled, 8MB]	↑ ↓ Select Item
Boot Display Device [CRT+LVDS]	Enter Go to Sub Screen
Flat Panel Type [800x600LVDS]	F1 General Help
	F10 Save and Exit
	ESC Exit
South Bridge Chipset Configuration	
Onboard Audio Controller [Enabled]	
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➤ **DRAM Frequency**

配置DRAM的频率，此处建议使用自动，手动更改配置可能会因为DRAM不支持而不开机。

➤ **Configure DRAM Timing by SPD**

BIOS按照SPD芯片上的内容配置SDRAM内存的时序。绝大多数内存条上有一个保存内存时序和容量等参数的一个小芯片，即SPD芯片。

➤ **Boots Graphic Adapter Priority**

此选项用于指定优先启动的显示设备类型。

➤ **Internal Graphics Mode Select**

此选项用于调整板载显卡共享物理内存的大小。

➤ **Boot Display Device**

此选项用于选择开机默认的显示输出设备。

➤ **Flat Panel Type**

此选项用于选择Flat Panel的分辨率。备选项User Define，可以根据用户自定义配置平板显示类型。

➤ **Onboard Audio Controller**

此选项用于开启板载声卡控制器。

◆ **PCIPnP**

BIOS SETUP UTILITY	
<u>Advanced PCI/PnP Settings</u>	
WARNING: Setting wrong values in below sections may	
IRQ3	[Available]
IRQ4	[Available]
IRQ5	[Available]
IRQ7	[Available]
IRQ9	[Available]
IRQ10	[Available]
IRQ11	[Available]
IRQ14	[Available]
IRQ15	[Available]
←→ Select Screen ↑ ↓ Select Item + - Change Field F1 General Help F10 Save and Exit ESC Exit	
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➤ **IRQ3~15**

此系列选项用以指定对应IRQ号是PNP方式还是保留给ISA使用。

◆ **Boot**

BIOS SETUP UTILITY	
Boot Settings	←→ Select Screen ↑ ↓ Select Item Enter Go to Sub Screen F1 General Help F10 Save and Exit ESC Exit
Quick Boot [Enabled]	
Quiet Boot [Disabled]	
Waite For 'F1' If Error [Enabled]	
Boot from Embedded WinCE [No]	
Boot Device Priority	
1 st Boot Device [USB:aigo USB DISK]	
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➤ **Quick Boot**

配置在BIOS引导期间是否允许跳过某些项的测试，减少BIOS引导时间。

➤ **Quiet Boot**

配置是否显示OEM LOGO内容。

➤ **Wait For 'F1' If Error**

配置在系统出错时是否提示按”F1”键。

➤ **Boot from Embedded WinCE**

此选项用于配置从嵌入式WinCE引导。注意：此项设为Yes时需要确保第一引导设备中有WinCE系统核心文件。

➤ **1st~4th Boot Device**

配置系统启动时优先权高低的启动设备。

◆ **Security**

BIOS SETUP UTILITY	
Security Settings	Install or Change the password
Supervisor Password :Not Installed	
User Password :Not Installed	←→ Select Screen
	↑ ↓ Select Item
Change Supervisor Password	Enter Change
Change User Password	F1 General Help
	F10 Save and Exit
	ESC Exit
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➤ **Change User/ Supervisor Password**

当按Change User/ Supervisor Password后，在对话框中输入新的密码后，此栏会显示用户密码已安装。

◆ **Exit**

South Bridge Configuration	
Exit Options	Exit system setup after saving the changes.
Save Changes and Exit	
Discard Changes and Exit	←→ Select Screen
Discard Changes	↑ ↓ Select Item
	Enter Go to Sub Screen
Load Optimal Defaults	F1 General Help
Load Failsafe Defaults	F10 Save and Exit
	ESC Exit
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➤ **Save Changes and Exit**

当您完成了所有的修改操作，想将原来的设置参数覆盖掉时，可执行此项功能，新的设置参数将保存在CMOS的存储器中。要执行此操作，先选定此选项并按下< Enter >键，再按< Enter >键即可退出。

➤ **Discard Changes and Exit**

当您所做的任何更改设置的动作不想存入CMOS的存储器中，可先选定此选项并按下< Enter >键，再按<Enter >键即可退出。

➤ **Discard Changes**

当您所做的任何更改设置的动作有误而需要忽略时，可先选定此选项并按下< Enter >键，然后可以再次进入相应选项进行重新设置。

➤ **Load Optimal Defaults**

此菜单用于在你的系统配置中装入缺省值。这些缺省设置是最优的，可以发挥所有硬件的高性能。

➤ **Load Failsafe Defaults**

该选项的功能是将各项设置初始化为实现最基本的和最安全的系统功能的值。要执行此项功能，先选中此选项按下< Enter >即可，接着系统会在屏幕上显示出您要确认的信息，按下< Enter >键确定执行该项功能。

x86 平台下 BIOS 所要管理的系统资源

这里的系统资源我们定义三种：I/O端口地址，IRQ中断号和DMA号。

◆ **DMA**

级别	功能
DMA0	DRAM 刷新
DMA1	未分配
DMA2	软盘
DMA3	未分配（有时用于硬盘）
DMA4	用于 DMAC 的级连
DMA5	未分配
DMA6	未分配
DMA7	未分配

◆ **APIC**

高级可编程中断控制器。在现代P4以上级别的主板中，大都支持APIC，可以提供多于16个中断源，如IRQ16—IRQ23，部分主板如支持PCI-X的主板可以有高达28个中断源。但要启用该功能必须相应的操作系统支持，目前只有windows 2000以上的操作系统支持。

◆ **I/O端口地址**

系统I/O地址空间总共有64K，每一外围设备都会占用一段I/O地址空间。下表给出了本CPU卡部分设备的I/O 地址分配，由于PCI设备（如PCI网卡）的地址是由软件配置的，表中没有列出。

地 址	设备描述
000h - 00Fh	DMA 控制器#1
020h - 021h	可编程中断控制器#1
040h - 043h	系统计时器
060h - 064h	标准 101/102 键盘控制器
070h - 071h	实时时钟, NMI
080h - 09Fh	DMA 页寄存器
0A0h - 0A1h	可编程中断控制器#2
0C0h - 0DFh	DMA 控制器#2
0F0h - 0FFh	数据数值处理器
170h - 177h	从 IDE
1F0h - 1F7h	主 IDE
279h、A79h	PnP 组态寄存器端口
295h - 296h	硬件监测器
2E8h - 2EFh	串行端口 #4 (COM4)
2F8h - 2FFh	串行端口 #2 (COM2)
376h	从 IDE (dual FIFO)
378h - 37Fh	并行端口#1 (LPT1)
3B0h - 3DFh	显示卡接口
3E8h - 3EFh	串行端口 #3 (COM3)
3F0h - 3F5h	标准软磁盘控制器
3F6h	主 IDE (dual FIFO)
3F8h - 3FFh	串行端口#1 (COM1)
0CF8h	PCI 组态地址寄存器端口
0CFCh	PCI 组态数据读写端口

◆ IRQ中断分配表

系统共有15个中断源，有些已被系统设备独占。只有未被独占的中断才可分配给其它设备使用。ISA设备要求独占使用中断；只有即插即用ISA设备才可由BIOS或操作系统分配中断。而多个PCI设备可共享同一中断，并由BIOS或操作系统分配。下表给出了X86平台部分设备的中断分配情况，但没有给出PCI设备所占用的中断资源。

级别	功能
IRQ0	系统计时器
IRQ1	标准 101/102 键或 Microsoft 键盘
IRQ2	可编程的中断控制器
IRQ3	串口#2
IRQ4	串口#1
IRQ5	保留
IRQ6	保留
IRQ7	保留
IRQ8	系统 CMOS/实时时钟
IRQ9	ACPI
IRQ10	串口#4
IRQ11	串口#5
IRQ12	保留
IRQ13	保留
IRQ14	主 IDE
IRQ15	从 IDE

第四章 驱动程序安装说明

显示驱动的说明

显示驱动的安装，在 IEGD_9_0_2_Windows\Utilities 文件夹下运行 Setup.exe 进行安装或卸载。

对显示驱动的配置(单显或双显),可以通过 IEGD_9_0_2_Windows\Utilities 文件夹下的 IEGDGUI.exe 进行,也可以通过显示属性中的高级选项进行配置。

linux core 9 系统安装说明

暂时无法正常安装linux core 9系统,如果需要安装,请联系我司技术支持定制。

本产品的其他驱动程序可依据配套光盘内容安装,在此不做介绍。

附录

Watchdog 编程指引

本板提供一个可按分或按秒计时的，最长达255级的可编程看门狗定时器（以下简称WDT）。通过编程，WDT超时事件可用来将系统复位或者产生一个可屏蔽中断。以下用C语言形式描述了WDT的编程。必须注意：在对WDT进行操作之前，需先进入WDT编程模式；在结束对WDT的操作之后，退出WDT。

对WDT的编程需遵循以下步骤：

- 进入WDT编程模式
- 设置WDT工作方式/启动WDT/关闭WDT
- 退出WDT编程模式

需要include 以下几个文件：

```
#include <stdio.h>
#include <dos.h>
#include <bios.h>
#include <stdlib.h>
#include <string.h>
```

(1) 进入WDT编程模式

```
outportb(0x2e, 0x67); //进入WDT编程模式，在INDEX PORT 写2次67
outportb(0x2e, 0x67); //INDEX PORT [4e /2e], DATA PORT[4F/2F]
outportb(0x2e, 0x07); //reg0X07, 用来选择logic device
outportb(0x2f, 0x08); //选择logic device8,
outportb(0x2e, 0x30); //reg0x30, 设备使能寄存器, 0=disable, 1=enable
outportb(0x2f, 0x01); //enable watchdog timer
```

(2) 设置WDT工作方式，复位和中断方式：

```
outportb(0x2e, 0x70);
char oldval = inportb(0x2f);
```

a. 配置WDT仅成复位工作方式

```
oldval &= 0xef; /*reg0x70.bit[4] 仅复位方式此位置0
O=WDTO
```

```
*/
```

```
outportb(0x70, oldval);
```

b. 配置WDT成中断和复位工作方式

```
oldval |= 0x10;
```

```
oldval |= IRQ_RESOURCE; /*reg0x70.bit[4]复位和中断方式此位置
```

```
1
```

```
1=WDT0 and IRQ
```

```
bit[3:0]WDT interrupt Mapping
```

```
可用中断: 03h~05h, 09h~0bh, 其他
```

```
不能中断
```

```
03h = IRQ3
```

```
04h = IRQ4
```

```
.....
```

```
*/
```

```
outportb(0x70, oldval);
```

(3) 选择WDT按分或按秒计时, 选择一种:

a. 选择WDT按分计时用以下语句:

```
;假定已处于WDT编程状态
```

```
outportb(0x2e, 0xf0); //选择按分计时, register 0xf0.bit[2:1]=10.
```

```
outportb(0x2f, 0x04);
```

b. 选择WDT按秒计时以下语句:

```
;假定已处于WDT编程状态
```

```
outportb(0x2e, 0xf0); //选择按秒计时, register 0xf0.bit[2:1]=01
```

```
outportb(0x2f, 0x02);
```

(4) 启动/禁止WDT

```
;假定已处于WDT编程状态
```

```
outportb(0x2e, 0xf1);
```

```
outportb(0x2f, TIME-OUT-VALUE);
```

```
outportb(0x2e, 0xf1);
```

```
outportb(0x2f, TIME-OUT-VALUE); //写两次预设的时间TIME-OUT-VALUE
```

注意：TIME-OUT-VALUE的取值范围从1到255，计时单位为“分”或“秒”。

写两次TIME-OUT-VALUE到寄存器则启动WDT，否则禁止WDT

如果TIME-OUT-VALUE为零，则禁止WDT。

(5) 退出WDT编程模式

outportb (0x2e, 0xaa) ;

GPIO 编程指引

本板通过芯片 PCA 9534 引出 8 个 PIN 脚，在硬件上 8 个 PIN 脚都默认设置为输入，可通过软件编程来设置其输入输出必要常量参数：及使用的寄存器描述
 PCI 空间：Bus: 0, Dev.: 31, fun: 3; Reg: 20~23---用来读取 SMBUS I/O 空间基地址 BAR

	PCA9534 地址 slave_adr=0x20;	Reg: 40 Bit[2] I2C_EN 位
		8 位地址的高 7 位 bit[7: 1]为硬件设置的地址 0x20，最后一位用来设置读和写功能，bit[0]=0, write; bit[0]=1, read;
	0x40:	地址和写命令,用于修改 GPIO 控制寄存器的值
	0x41	地址和读命令,用于读取 GPIO 控制寄存器的值

4个GPIO控制寄存器

0x00-input port (Read), bit7~bit0值为1时对应pin为高电平，为0时为低电平。

0x01-output port (Read/Write), bit7~bit0值为1时对应pin为高电平，为0时为低电平。

0x02-Polarity Inversion (Read/Write), 默认值为0x00, bit7~bit0值为1时电平反转。

0x03-Configuration (Read/Write), 默认值为0xff, enable/disable

output/input功能, bit7~bit0值为1时对应pin

output功能disable, input功能enable; bit7~bit0值为0时对应pin output功能enable, input功能disable。

5个SMBUS寄存器:

BAR+Offset 0x00 : HST_STS 状态寄存器 :

BAR+Offset 0x02 : HST_CNT 控制寄存器

BAR+Offset 0x03 : HST_CMD 命令寄存器, Bit[7: 0]用来选择GPIO控制寄存器

BAR+Offset 0x04 : XMIL_SLAVE 地址寄存器, Bit[7: 0]用来写入Slave Address和读写位。

BAR+Offset 0x05 : DATA0: 数据寄存器, 用来存放接收和发送的数据。

编程控制流程:

1. 读取基地址: 进入 PCI 配置空间, 读取 Smbus 地址 BAR, 并将 I2C_EN 位置 0。
2. 写 GPIO 控制寄存器: 进入 Smbus I/O 空间, 写 0xbf 到 HST_STS, 清状态位, 将 HST_CNT 寄存器的 bit[4:2] 设置为 010, 写 0x40 (写命令) 到 XMIL_SLAVE 寄存器, 写 GPIO 控制寄存器 0x03 到 HST_CMD, 写 0x0f 到 DATA0, 将 GPIO 控制寄存器 0x03 的值修改为 0x0f, 将 GP1, 3, 5, 7 设置为 output, GP2, 4, 6, 8, 设置为 input 。
3. 开始: 将 HST_CNT bit[6]START 置 1, 开始传送地址, 命令和数据, 循环读取 HST_STS 状态寄存器, 当 bit[2]DEV_ERR 位被置 1 时, 表示传送出错; 当 bit[1]INTR 被置 1 时, 表示发送完成, 可进行下一步操作。
4. 仿照步骤 2, 可以对其他 GPIO 控制寄存器进行修改。
5. 读 GPIO 控制寄存器: 进入 Smbus I/O 空间, 写 0xbf 到 HST_STS, 清状态位, 将 HST_CNT 寄存器的 bit[4:2] 设置为 010, 写 0x41 (读命令) 到 XMIL_SLAVE 寄存器, 写 GPIO 控制寄存器 0x00 到 HST_CMD, 。
6. 开始: 将 HST_CNT bit[6]START 置 1, 开始传送地址, 命令和, 循环读取 HST_STS 状态寄存器, 当 bit[2]DEV_ERR 位被置 1 时, 表示传送出错; 当 bit[1]INTR 被置 1 时, 表示发送完成, 这时 input 寄存器即 input 引脚的电平值被放置在 DATA0 寄存器中, 读取 DATA0 寄存器获取 input 引脚的电平。可根据上面编程流程设置输入输出引脚, 和高电平。

欲获更多信息请访问研祥网站: <http://www.evoc.com>。

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Safety Instructions

1. Please carefully read the users' manual before handling the product;
2. For the board which is not ready to be installed, please put it in the anti-static packaging;
3. Before taking the board out from anti-static packaging, please put your hand on grounded metal object for a while (about 10 seconds) to discharge static;
4. Please wear static protective gloves when holding the board; and always hold the board by edges;
5. Before inserting, removing or re-configuring the motherboard or the expansion card, please firstly disconnect the AC power or unplug the AC power cable from the power source to prevent damage to the product and ensure your personal safety;
6. Before removing the boards or Box PC, firstly turn off all power resources and unplug the power cable from power source;
7. For Box PC products, when inserting or removing boards, please disconnect the AC power in advance;
8. Before connecting or disconnecting any device, make sure all power cables are unplugged in advance;
9. To avoid unnecessary damage caused by turning on/off computer frequently, wait at least 30 seconds before re-turning on the computer.

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Chapter 1 Product Introduction

Overview

This product is a sort of industrial-level embedded PC104 motherboard with high performance and low power consumption. It adopts Intel® Atom™ N270 CPU and Mobile Intel® 945GSE + ICH7M chipset; the maximum power consumption of the motherboard is limited within 12W (including CF card and 1G on-board memory). The product features in stable, safe, reliable and practical, therefore, it could be widely applied in the fields of military, medical, numerical control, communication and transportation, etc.

Mechanical Dimension, Weight and Environment

- Dimension: 115.6mm (L) × 103.1mm (W) × 23.2mm (H);
- Net Weight: 0.24Kg;
- Operating Environment:
 - Temperature: -20°C ~ +70°C;
 - Humidity: 5% ~ 90% (Non-condensing);
- Storage Environment:
 - Temperature: -40°C ~ +85°C;
 - Humidity: 5% ~ 90% (Non-condensing).

Typical Consumption

CPU: On-board Intel® Atom™ 1.6G

Memory: on-board 1G DDR2 533MHz

- +5V@2.24A; +5%/-3%;

Microprocessor

Intel® Atom™ N270 1.6G/533MHz/512k/FCBGA8-437 CPU.

Chipset

Intel® 945GSE + ICH7M

System Memory

1G DDR2 533MHz memory;

Video Function

Adopt video module integrated in Mobile Intel® 945GSE chipset; it assigns video memory according to requirement; supports VGA display, dual-channel LVDS display (18bit) and VGA + LVDS dual-display function.

Network Function

One 10/100/1000Mbps Ethernet port, provides high-speed and stable network platform selection.

Power Feature

Adopt AT 5V single power supply.

Expansion Bus

Support standard PC/104 and PC/104-Plus expansion buses.

AUDIO Function

Integrate one dual-track HD audio card, it supports Mic-in/Line-in/Speaker-out.

IDE Function

One 44Pin IDE hard disk connector and one TYPE1 CF card connector; two SATA connectors.

I/O Function

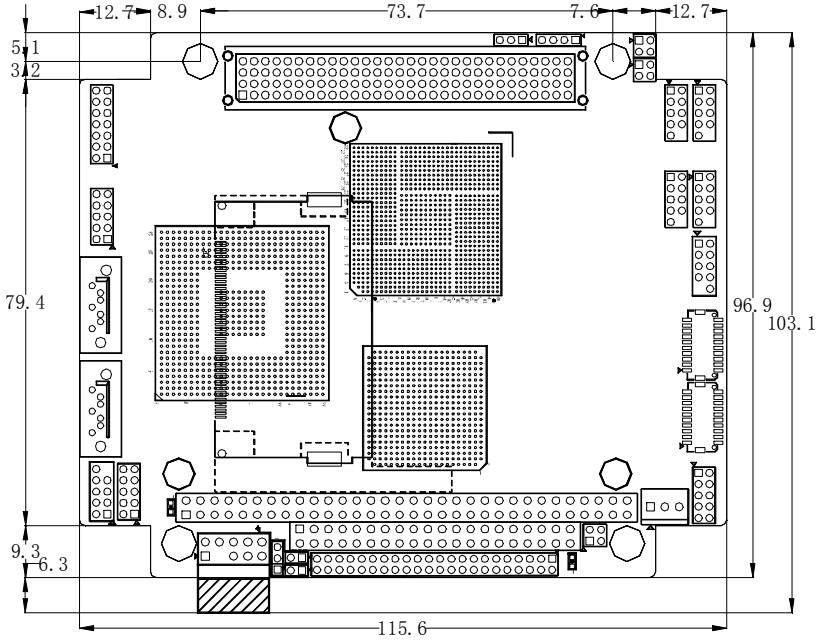
- Two USB2.0 ports, support four USB devices at the same time;
- Four COMs, COM1 and COM2 support RS232 mode; COM3 and COM4 support RS422/RS485 mode;
- One programmable digital I/O connector (four for input and four for output).

Watchdog Function

- 255 levels, programmable by seconds;
- Overtime interrupt or system reset.

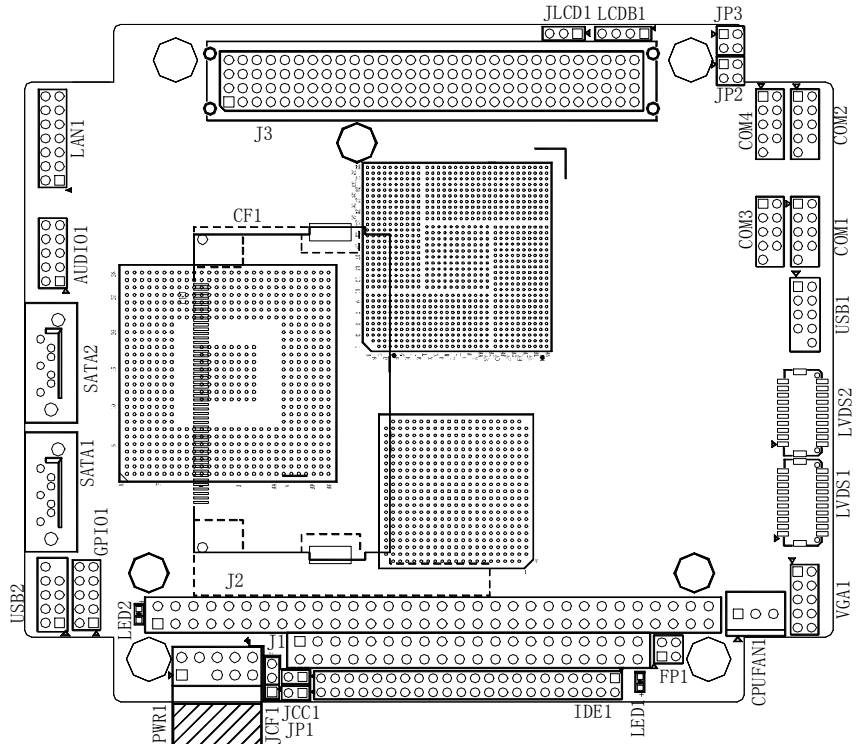
Chapter 2 Installation

Product Outline

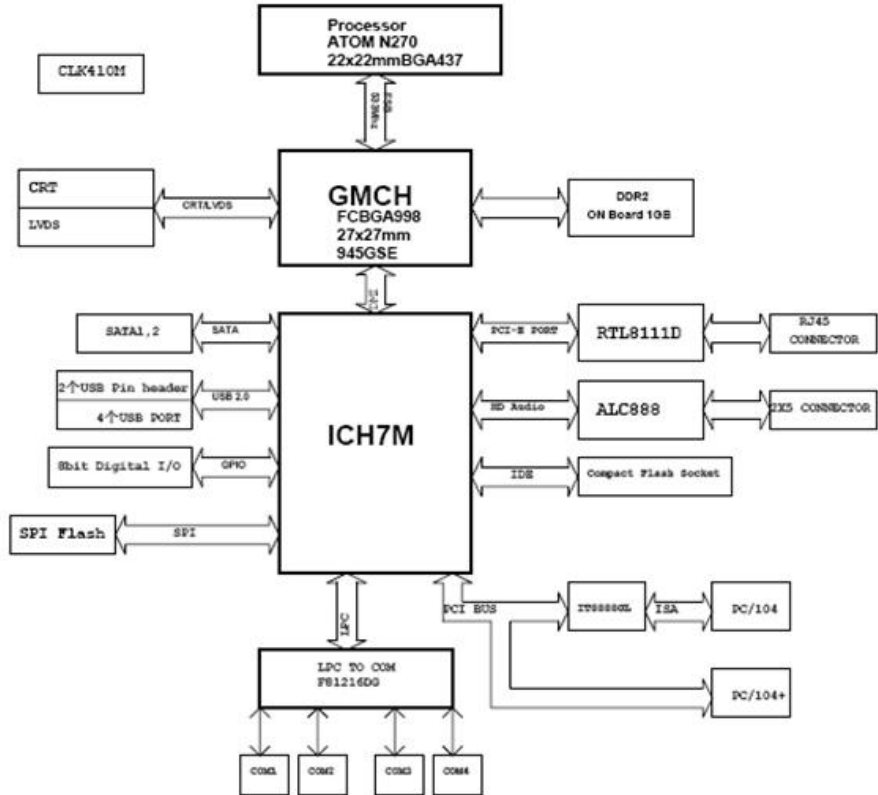


(Unit: mm)

Locations of Connectors



Motherboard Structure



Jumper Function Setting

1. JCC1: Clear/Keep CMOS Setting (Pin Distance: 2.0mm)

CMOS is powered by the button battery on board. Clear CMOS will restore original settings (factory default). The steps are listed as follows : (1) Turn off the computer and unplug the power cable; (2) Instantly short circuit JCC1 solder pad; (3) Turn on the computer; (4) Follow the prompt on screen to enter BIOS setup when starting the computer, load optimized defaults; (5) Save and exit.



JCC1

Setting	Function
1-2 Open	Normal (Default)
1-2 Short	Clear CMOS, all the BIOS setup recovers to factory default.

2. Select Master and Slave for CF Card (Pin Distance: 2.0mm)



JP1

Setting	Function
1-2 Short	Master
1-2 Open	Slave (Default)

3. Select RS-422/485 Mode for COMs (Pin Distance: 2.0mm)

COM3 and COM4 only support RS-422/RS-485 transmission mode, which could realize mode selection for COM3 and COM4 by JP2 and JP3 setting.

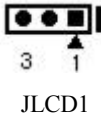


JP2/JP3

Pin Setting	Mode Selection	
	RS-485(Default)	RS-422
JP2	1-2 Short	3-4 Open
JP3	1-2 Open	3-4 Short

4. Select LCD Operating Voltage (Pin Distance: 2.0mm)

Different LCD screens have different voltages; the board provides two voltage options, 3.3V and 5V. Only when the selected LCD voltage is in accord with the LCD voltage in use, can the LCD screen display normally.



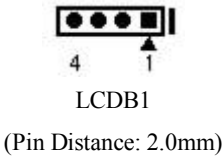
Setting	Function
1-2 Short	+3.3V (Default)
2-3 Short	+5V

5. Select Voltage for CF Card (Pin Distance: 2.0mm)



Setting	Function
1-2 Short	+3.3V
2-3 Short	+5V (Default)

LCD Backlight Control Connector



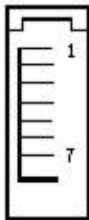
Pin	Signal Name
1	VCC12
2	LCD_BKLTCTL
3	LCD_BKLTEN
4	GND

Note: VCC12---backlight power (power voltage is controlled by the backlight voltage selecting jumper)

LCD_BKLTCTL---backlight control; LCD_BKLTEN---backlight enabling.

SATA Connector

The board provides two SATA connectors.

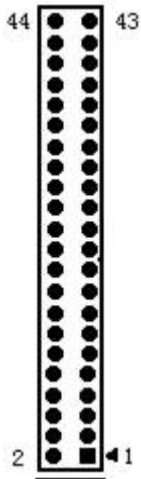


Pin	Signal Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

IDE Connector

The board provides one IDE port. Pay attentions as follows when installing the IDE device: one IDE connector could only connect with one IDE device. The board provides corresponding jumpers to configure it to master device or slave device.

When the IDE is set to master device, the CF card is the slave device; vice versa.



IDE1

(Pin Distance:

2.0mm)

Pin	Signal Name	Pin	Signal Name
1	RESET#	2	GND
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	GND	20	Key
21	DREQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	IRDY	28	GND
29	DACK#	30	GND
31	IRQ	32	NC
33	DA1	34	ATA66_DET
35	DA0	36	DA2
37	CS1#	38	CS3#
39	LED#	40	GND
41	+5V	42	+5V
43	GND	44	GND

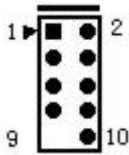
CF Card

Compact Flash card is a sort of high speed memory, small in size and easy to use. Its storage capacity will vary with different cards in use, such as 128M, 256M etc. CF card could only be inserted in one direction and it is marked as CF1 on the rear of the board.

Pin	Signal Name	Pin	Signal Name
1	GND	26	CD1#
2	D3	27	D11
3	D4	28	D12
4	D5	29	D13
5	D6	30	D14
6	D7	31	D15
7	CS0#	32	CS1#
8	GND	33	VS1#
9	ATASEL#	34	IOR#
10	GND	35	IOW#
11	GND	36	WE#
12	GND	37	IRQ
13	VCC	38	VCC
14	GND	39	CSEL#
15	GND	40	VS2#
16	GND	41	RESET#
17	GND	42	IORDY
18	A2	43	DREQ
19	A1	44	DACK#
20	A0	45	DASP#
21	D0	46	ATA66_DET
22	D1	47	D8
23	D2	48	D9
24	WP/IOCS16#	49	D10
25	CD2#	50	GND

USB Port

The board provides two sets of USB ports (Pin Distance: 2.0mm), they could connect with four standard USB devices.



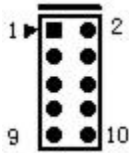
USB1/USB2

Pin	Signal Name	Pin	Signal Name
1	+5V	2	+5V
3	USB1_Data-	4	USB2_Data-
5	USB1_Data+	6	USB2_Data+
7	GND	8	GND
9	NC	10	GND_CHASSIS

Video Connector

1. 10Pin VGA Connector(Pin Distance: 2.0mm)

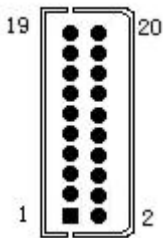
Transfer cable is required to connect with standard VGA device and the pin definitions are listed as follows:



VGA1

Pin	Signal Name	Pin	Signal Name
1	VSYNC	2	HSYNC
3	DDCDATA	4	Red
5	DDCCLK	6	Green
7	+5V	8	Blue
9	GND	10	GND

2. Dual-channel (18bit) LVDS Connector (Pin Distance: 1.0mm)



LVDS1/LVDS2

Pin	Signal Name	Pin	Signal Name
1	LVDS_D0+	2	LVDS_D0-
3	GND	4	GND
5	LVDS_D1+	6	LVDS_D1-
7	GND	8	GND
9	LVDS_D2+	10	LVDS_D2-
11	GND	12	GND
13	CLK+	14	CLK-
15	GND	16	GND
17	NC	18	NC
19	VDD	20	VDD

Note: to be compatible with the LVDS screen with resolution of 640×480, default setting in BIOS is 640×480; when using VGA or LVDS screen with high resolution, make sure to set the resolution to 800×600 or higher in CMOS; please refer to *BIOS Setup Guide* for way of setting.

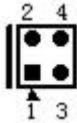
LED Indicator



LED1/LED2

LED	Function
LED1	Hard Disk Indicator
LED2	Power Indicator

Multi-function Connector



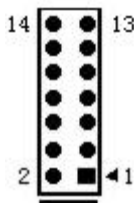
FP1

(Pin Distance: 2.0mm)

Pin	Signal Name	Pin	Signal Name
1	SPEAK-	2	+5V
3	RESET	4	GND

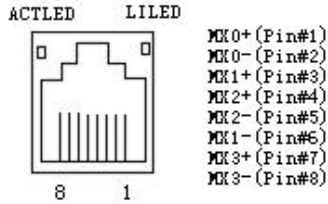
LAN Port

The board provides a set of 10/100/1000Mbps LAN port (LAN1, Pin Distance: 2.0mm); transfer cable is required to fix the port to the chassis before connecting with peripheral device. The pin definitions are as follows:



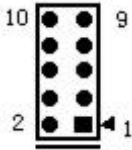
LAN1

Pin	Signal Name	Pin	Signal Name
1	MX0	2	MX0-
3	MX1+	4	MX1-
5	MX2+	6	MX2-
7	MX3+	8	MX3-
9	GND	10	GND
11	LINK_LED+	12	LINK_LED-
13	ACT_LED+	14	ACT_LED-



ACTLED (Green)	LAN Activity Indicator	LILED (Dual-Color: Y/G)	LAN Speed Indicator
Blink	Data Transmitting	Green	1000Mbps
Off	No Data to Transmit	Yellow	100Mbps
		Off	10Mbps

Audio Connector

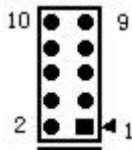


AUDIO1
(Pin Distance: 2.0mm)

Pin	Signal Name	Pin	Signal Name
1	LOUT_R	2	LOUT_L
3	AGND	4	AGND
5	LIN_R	6	LIN_L
7	AGND	8	AGND
9	MIC_L	10	MIC_R

Digital I/O Connector

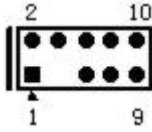
The board provides GPIO port with four channels for input and 4 channels for output (Pin Distance: 2.0mm).



GPIO1

Pin	Signal Name	Pin	Signal Name
1	INPUT0	2	OUTPUT0
3	INPUT1	4	OUTPUT1
5	INPUT2	6	OUTPUT2
7	INPUT3	8	OUTPUT3
9	GND	10	NC

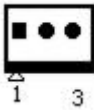
Power Connector



PWR1
 (Pin Distance: 2.54mm)

Pin	Signal Name	Pin	Signal Name
1	GND	2	+5V
3	NA	4	+12V
5	NC	6	NC
7	GND	8	+5V
9	GND	10	+5V

Fan Connector



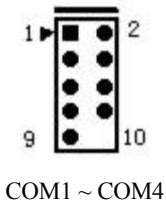
CPUFAN1
 (Pin Distance: 2.54mm)

Pin	Signal Name
1	GND
2	+5V
3	NC

Serial Port

The board provides four 2x5Pin-type COMs; transfer cable is required to fix the port with the chassis before connecting with peripheral devices. COM1 and COM2 support RS-232 mode while COM3 and COM4 support RS-422/RS-485 selection.

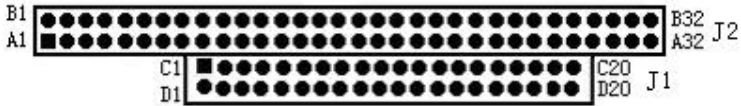
(Pin Distance: 2.0mm)



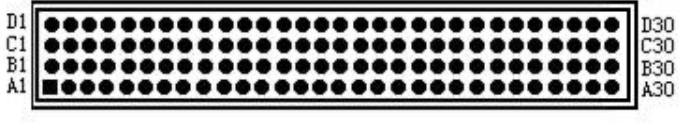
COM1 ~ COM4

Pin	Signal Name (COM1, COM2)	Signal Name (COM3, COM4)	
	RS-232	RS-422	RS-485
1	DCD#	TXD-	Data-
2	RXD	TXD+	Data+
3	TXD	RXD+	X
4	DTR#	RXD-	X
5	GND	GND	GND
6	DSR#	X	X
7	RTS#	X	X
8	CTS#	X	X
9	RI#	X	X
10	NA	NA	NA

PC/104 Connector



Pin	Signal Name	Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
A1	IOCHCK#	B1	GND	C1	GND	D1	GND
A2	SD7	B2	RESET	C2	SBHE#	D2	MEMCS16#
A3	SD6	B3	+5V	C3	LA23	D3	IOCS16#
A4	SD5	B4	IRQ9	C4	LA22	D4	IRQ10
A5	SD4	B5	-5V	C5	LA21	D5	IRQ11
A6	SD3	B6	DRQ2	C6	LA20	D6	IRQ12
A7	SD2	B7	-12V	C7	LA19	D7	IRQ15
A8	SD1	B8	SRDY#	C8	LA18	D8	IRQ14
A9	SD0	B9	+12V	C9	LA17	D9	DACK0#
A10	IOCHRDY	B10	KEY	C10	MEMR#	D10	DRQ0
A11	AEN	B11	SMEMW#	C11	MEMW#	D11	DACK5#
A12	SA19	B12	SMEMR#	C12	SD8	D12	DRQ5
A13	SA18	B13	IOW#	C13	SD9	D13	DACK6#
A14	SA17	B14	IOR#	C14	SD10	D14	DRQ6
A15	SA16	B15	DACK3#	C15	SD11	D15	DACK7#
A16	SA15	B16	DRQ3	C16	SD12	D16	DRQ7
A17	SA14	B17	DACK1#	C17	SD13	D17	+5V
A18	SA13	B18	DRQ1	C18	SD14	D18	MASTER#
A19	SA12	B19	REFRESH#	C19	SD15	D19	GND
A20	SA11	B20	BCLK	C20	KEY	D20	GND
A21	SA10	B21	IRQ7				
A22	SA9	B22	IRQ6				
A23	SA8	B23	IRQ5				
A24	SA7	B24	IRQ4				
A25	SA6	B25	IRQ3				
A26	SA5	B26	DACK2#				
A27	SA4	B27	TC				
A28	SA3	B28	BALE				
A29	SA2	B29	+5V				
A30	SA1	B30	OSC				
A31	SA0	B31	GND				
A32	GND	B32	GND				

PC/104 Plus Slot


Pin	Signal Name	Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
A1	KEY	B1	NC	C1	+5V	D1	AD0
A2	NC	B2	AD2	C2	AD1	D2	+5V
A3	AD5	B3	GND	C3	AD4	D3	AD3
A4	C/BE0#	B4	AD7	C4	GND	D4	AD6
A5	GND	B5	AD9	C5	AD8	D5	GND
A6	AD11	B6	NC	C6	AD10	D6	NC
A7	AD14	B7	AD13	C7	GND	D7	AD12
A8	+3.3V	B8	C/BE1#	C8	AD15	D8	+3.3V
A9	SERR#	B9	GND	C9	NC	D9	PAR
A10	GND	B10	PERR#	C10	+3.3V	D10	NC
A11	STOP#	B11	+3.3V	C11	PLOCK#	D11	GND
A12	+3.3V	B12	TRDY#	C12	GND	D12	DEVSEL#
A13	FRAME#	B13	GND	C13	IRDY#	D13	+3.3V
A14	GND	B14	AD16	C14	+3.3V	D14	C/BE2#
A15	AD18	B15	+3.3V	C15	AD17	D15	GND
A16	AD21	B16	AD20	C16	GND	D16	AD19
A17	+3.3V	B17	AD23	C17	AD22	D17	+3.3V
A18	IDSEL0	B18	GND	C18	IDSEL1	D18	IDSEL2
A19	AD24	B19	C/BE3#	C19	NC	D19	IDSEL3
A20	GND	B20	AD26	C20	AD25	D20	GND
A21	AD29	B21	+5V	C21	AD28	D21	AD27
A22	+5V	B22	AD30	C22	GND	D22	AD31
A23	REQ0#	B23	GND	C23	REQ1#	D23	NC
A24	GND	B24	REQ2#	C24	+5V	D24	GNT0#
A25	GNT1#	B25	NC	C25	GNT2#	D25	GND
A26	+5V	B26	CLK0	C26	GND	D26	CLK1
A27	CLK2	B27	+5V	C27	CLK3	D27	GND
A28	GND	B28	PIRQD#	C28	+5V	D28	RESET#
A29	+12V	B29	PIRQA#	C29	PIRQB#	D29	PIRQC#
A30	-12V	B30	REQ3#	C30	GNT3#	D30	KEY

Chapter 3 BIOS Setup

Overview

BIOS (Basic Input and Output System) is solidified in the flash memory on the CPU board. Its main functions include: initialize system hardware, set the operating status of the system components, adjust the operating parameters of the system components, diagnose the functions of the system components and report failures, provide hardware operating and controlling interface for the upper level software system, guide operating system and so on. BIOS provides users with a human-computer interface in menu style to facilitate the configuration of system parameters for users, control power management mode and adjust the resource distribution of system device, etc.

Setting the parameters of the BIOS correctly could enable the system operating stably and reliably; it could also improve the overall performance of the system at the same time. Inadequate even incorrect BIOS parameter setting will decrease the system operating capability and make the system operating unstably even unable to operate normally.

BIOS Parameter Setup

Prompt message for BIOS setting may appear once powering on the system. At that time (inefficient at other time), press the key specified in the prompt message (usually) to enter BIOS setting.

When the BIOS setting in CMOS is destroyed, system may also require entering BIOS setting or selecting certain default value.

All the setup values modified by BIOS are saved in the CMOS storage in system. The CMOS storage is powered by battery; unless clearing CMOS contents, or else its contents will not be lost even if powered off.

Note! BIOS setting will influence the computer performance directly. Setting parameter improperly will cause damage to the computer; it may even be unable to power on. Please use the internal default value of BIOS to restore the system.

Our company is constantly researching and updating BIOS, its setup interface may be a bit different. The figure below is for reference only; it may be different from your BIOS setting in use.

BIOS Basic Function Setup

After starting SETUP program, you may see the main interface of CMOS Setup Utility as follows:

BIOS SETUP UTILITY	
System Overview	←→ Select Screen
Processor	↑↓ Select Item
Type :	+ - Change Field
Genuine Intel(R) CPU N270 @ 1.60GHz	Tab Select Field
Speed :1600MHz	F1 General Help
System Memory	F10 Save and Exit
Size :1016MB	ESC Exit
System Time [00:47:55]	
System Date [Wed 01/02/2002]	
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◆ Main

➤ System Time

Choose this option and set current time by < + > / < - >, which is displayed in format of hour/minute/second. Reasonable range for each option is: Hour (00-23), Minute (00-59), Second (00-59).

➤ System Date

Choose this option and set current data by < + > / < - >, which is displayed in format of month/date/year. Reasonable range for each option is: Month (Jan.-Dec.), Date (01-31), Year (Maximum to 2099), Week (Mon. ~ Sun.).

◆ **Advanced**

BIOS SETUP UTILITY	
<p>Advanced Settings</p> <p>WARNING:Setting wrong values in below sections may cause system to malfunction</p> <ul style="list-style-type: none"> ▶ CPU Configuration ▶ IDE Configuration ▶ Super I/O Configuration ▶ ISA I/O Decode Configuration ▶ ISA Memory Decode Configuration ▶ USB Configuration ▶ Power Management Configuration ▶ Clock Generator Configuration 	<p>Configure CPU</p> <p>←→ Select Screen ↑↓ Select Item Enter Go to Sub Screen Tab Select Field F1 General Help F10 Save and Exit ESC Exit</p>
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➤ **CPU Configuration**

BIOS SETUP UTILITY	
<p>Configure advanced CPU settings</p> <p>Brand String:</p> <p>Genuine Intel(TM)2 CPU N270 @1.60GHz</p> <p>Frequency; :1.60GHz</p> <p>FSB Speed; :533MHz</p> <p>Cache L1; :24 KB</p> <p>Cache L2; :512KB</p> <p>Ratio Actual Value :12</p> <p>Hyper Threading Technology [Enabled]</p> <p>Intel(R) SpeedStep(tm)tech [Enabled]</p>	<p>←→ Select Screen ↑↓ Select Item + - Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit</p>
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➤ **IDE Configuration**

BIOS SETUP UTILITY	
IDE Configuration	
ATA/IDE Configuration	[Enhanced]
Configure SATA as	[IDE]
Configure SATA Channels	[Before PATA]
▶ Primary IDE Master	:[Not Detected]
▶ Primary IDE Slave	:[Not Detected]
▶ Secondary IDE Master	:[Not Detected]
▶ Secondary IDE Slave	:[Not Detected]
▶ Third IDE Master	:[Not Detected]
▶ Third IDE Slave	:[Not Detected]
←→ Select Screen ↑↓ Select Item + - Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit	
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● **ATA/IDE Configuration**

This option is used to configure the operating mode for ATA; Enhanced and Compatible are corresponding with Enhanced mode and Compatible mode.

● **Configure SATA as**

SATA controller type selection; there are three options for this item: IDE, RAID and AHCI. Only when ATA/IDE Configuration is under Enhanced mode, are RAID and AHCI supported.

Both RAID and AHCI functions require supports from hardware chip and OS.

● **Configure SATA Channels**

Configure SATA channel type, corresponding with the options Before PATA and Behind PATA.

● **Primary ~ Third IDE Master/Slave**

*** Type**

Not Installed: IDE device cannot be detected by system;

AUTO: automatic detection of IDE parameters when power on;

CD/DVD: used for ATAPI CDROM;

ARMD: used for various analog IDE devices.

*** LBA/Large Mode**

Used to set whether to support LBA mode or not.

*** Block(Multi-sector Transfer)**

Used to set whether to support multi-sector simultaneous transfer or not.

*** PIO Mode**

Used for PIO mode setting.

*** DMA Mode**

Used for DMA mode setting.

*** S.M.A.R.T**

Used to set whether to enable S.M.A.R.T function and it is only effective for the hard disk supporting this function.

*** 32Bit Data Transfer**

This option is used to enable 32-bit hard disk accessing mode, which could optimize hard disk read and write speed.

➤ **Super I/O Configuration**

BIOS SETUP UTILITY		
Configure Super I/O Chipset	Allows BIOS to Enable or Disable Floppy Controller.	
Serial Port1 Address [3F8]	←→ Select Screen ↑↓ Select Item + - Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit	
Serial Port1 IRQ [4]		
Serial Port2 Address [2F8]		
Serial Port2 IRQ [3]		
Serial Port1 Address [3E8]		
Serial Port1 IRQ [10]		
Serial Port2 Address [2E8]		
Serial Port2 IRQ [11]		
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● **Serial Port 1-4 Address**

Set the IO address of COM 1-4 on motherboard; the options are: Disabled, 3F8H, 3E8, 2E8 and 2F8H.

● **Serial Port 1-4 IRQ**

Set the IRQ resource of COM1-4 on motherboard; the options are: 3, 4, 10 and 11.

➤ **ISA I/O Decode Configuration**

BIOS SETUP UTILITY	
Configure ISA I/O Address	
Decode I/O Space 0	[Enabled]
Decode I/O Base 0	[0100h]
Decode I/O Size 0	[64 Bytes]
Decode I/O Space 1	[Enabled]
Decode I/O Base 1	[0140h]
Decode I/O Size 1	[32 Bytes]
Decode I/O Space 2	[Enabled]
Decode I/O Base 2	[0200h]
Decode I/O Size 2	[128 Bytes]
Decode I/O Space 3	[Enabled]
Decode I/O Base 3	[0300h]
Decode I/O Size 3	[64 Bytes]
Decode I/O Space 4	[Enabled]
Decode I/O Base 4	[0340h]
Decode I/O Size 4	[32 Bytes]
Decode I/O Space 5	[Enabled]
Decode I/O Base 5	[0A70h]
Decode I/O Size 5	[16 Bytes]
←→ Select Screen ↑↓ Select Item + - Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit	
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● **Decode I/O Space(0-5)**

Decode IO space switch (n)

● **Decode I/O Base(0-5)**

Decode IO space base address

- **Decode I/O Size(0-5)**

Decode IO space size

➤ **ISA Memory Decode Configuration**

BIOS SETUP UTILITY	
Configuration ISA Memory Address By WB83628	
Memory Space 0	[Disabled]
Decode MEM Base 0	[0000]
Decode MEM Size 0	[16 KB]
Memory Space 1	[Disabled]
Decode MEM Base 1	[0000]
Decode MEM Size 1	[16 KB]
Memory Space 2	[Disabled]
Decode MEM Base 2	[0000]
Decode MEM Size 2	[16 KB]
Memory Space 3	[Disabled]
Decode MEM Base 3	[0000]
Decode MEM Size 3	[16 KB]
←→ Select Screen ↑↓ Select Item + - Change Field F1 General Help F10 Save and Exit ESC Exit	
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- **Memory Space(0-3)**

Memory decode space switch

- **Decode MEM Base(0-3)**

Memory decode space base address

- **Decode MEM Size(0-3)**

Memory decode space size

➤ **USB Configuration**

BIOS SETUP UTILITY	
USB Configuration	Enables USB host controllers.
USB Devices Enabled :	
1 Keyboard, 1 Drive	
▶ USB Mass Storage Device Configuration	←→ Select Screen ↑↓ Select Item + - Change Field F1 General Help F10 Save and Exit ESC Exit
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● **USB Mass Storage Device Configuration**

This option is used to configure the USB mass storage device, including Reset time delay setting and enumeration type.

➤ **Power Management Configuration**

BIOS SETUP UTILITY	
Power Management Configuration	
ACPI APIC Support [Enabled]	
	←→ Select Screen ↑↓ Select Item + - Change Field F1 General Help F10 Save and Exit ESC Exit
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● **ACPI APIC Support**

This option is used to enable or disable the APIC under ACPI OS.

➤ **Clock Generator Configuration**

BIOS SETUP UTILITY	
Configure Clock Generator	←→ Select Screen
Spread Spectrum Control [Enabled]	↑↓ Select Item
Auto PCI Clock [Enabled]	+ - Change Field
	F1 General Help
	F10 Save and Exit
	ESC Exit
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● **Spread Spectrum Control**

This option is used to control the spread spectrum function of the clock signal.

● **Auto PCI Clock**

This option is used to realize the automatic detection of the devices in PCI slot. If there is no device in the slot, disable the clock signal corresponding with the slot.

◆ **Chipset**

BIOS SETUP UTILITY	
Advanced Chipset Settings	
WARNING: Setting wrong values in below sections may cause system to malfunction.	
North Bridge Chipset Configuration	
DRAM Frequency [Auto]	
Configure DRAM Timing by SPD [Enabled]	←→ Select Screen
Boots Graphic Adapter Priority [PEG/PCI]	↑↓ Select Item
Internal Graphics Mode Select [Enabled, 8MB]	Enter Go to Sub Screen
Boot Display Device [CRT+LVDS]	F1 General Help
Flat Panel Type [800x600LVDS]	F10 Save and Exit
	ESC Exit
South Bridge Chipset Configuration	
Onboard Audio Controller [Enabled]	
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➤ **DRAM Frequency**

Configure the frequency for DRAM; it is recommended to use automatic modification instead of manual modification; otherwise, it will not be able to power on because it is not supported by DRAM.

➤ **Configure DRAM Timing by SPD**

BIOS configures the time sequence of the SDRAM according to the contents of the SPD chip. Most of the memory bank has one small chip to save the time sequence and capacity of the memory, i.e. the SPD chip.

➤ **Boots Graphic Adapter Priority**

This option is used to specify the booted priority of video device type.

➤ **Internal Graphics Mode Select**

This option is used to adjust the shared physical memory size of the on-board video card.

➤ **Boot Display Device**

This option is used to select the default video output device when booting.

➤ **Flat Panel Type**

This option is used to select the resolution of the Flat Panel. The prepared resolution is User Define, which configures the flat panel type according to user define.

➤ **Onboard Audio Controller**

This option is used to select whether to enable the audio card controller.

◆ **PCIPnP**

BIOS SETUP UTILITY	
<u>Advanced PCI/PnP Settings</u>	
WARNING:Setting wrong values in below sections may	
IRQ3	[Available]
IRQ4	[Available]
IRQ5	[Available]
IRQ7	[Available]
IRQ9	[Available]
IRQ10	[Available]
IRQ11	[Available]
IRQ14	[Available]
IRQ15	[Available]
←→ Select Screen ↑↓ Select Item +- Change Field F1 General Help F10 Save and Exit ESC Exit	
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➤ **IRQ3 ~ 15**

This option is used to specify whether the IRQ number is in PNP mode or reserved for ISA.

◆ **Boot**

BIOS SETUP UTILITY	
Boot Settings	←→ Select Screen ↑↓ Select Item Enter Go to Sub Screen F1 General Help F10 Save and Exit ESC Exit
Quick Boot [Enabled]	
Quiet Boot [Disabled]	
Waite For 'F1' If Error [Enabled]	
Boot from Embedded WinCE [No]	
Boot Device Priority	
1 st Boot Device [USB:aigo USB DISK]	
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➤ **Quick Boot**

During BIOS booting period, configure whether to permit skipping certain test, to reduce BIOS guiding time.

➤ **Quiet Boot**

Configure whether to display the content of OEM LOGO.

➤ **Wait For 'F1' If Error**

Configure whether to prompt pressing "F1" during system error.

➤ **Boot from Embedded WinCE**

This option is used to set to boot from the embedded WinCE. Note: when it is set to "Yes", you have to make sure there are core files of the WinCE system in the first booting device.

➤ **1st ~ 4th Boot Device**

Configure the preference of the startup sequence for devices when the system starts.

◆ **Security**

BIOS SETUP UTILITY	
Security Settings	Install or Change the password
Supervisor Password :Not Installed	
User Password :Not Installed	←→ Select Screen
	↑↓ Select Item
Change Supervisor Password	Enter Change
Change User Password	F1 General Help
	F10 Save and Exit
	ESC Exit
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➤ **Change User/ Supervisor Password**

After pressing Change User/ Supervisor Password and input new password in the dialog box, this column will indicate that user's password has been installed.

◆ **Exit**

South Bridge Configuration	
Exit Options	Exit system setup after saving the changes.
Save Changes and Exit	
Discard Changes and Exit	←→ Select Screen
Discard Changes	↑↓ Select Item
	Enter Go to Sub Screen
Load Optimal Defaults	F1 General Help
Load Failsafe Defaults	F10 Save and Exit
	ESC Exit
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➤ **Save Changes and Exit**

When you have finished all the changes and want to cover the original parameters, you may implement this operation and save the new parameters into CMOS storage. To implement this operation, you may choose this option and press < Enter >; press < Enter > again to exit.

➤ **Discard Changes and Exit**

If you do not want to save the change into CMOS storage, please choose this option and press < Enter >; press < Enter > again to exit.

➤ **Discard Changes**

If error occurs in your change and need to be neglected, please choose this option and press < Enter > in order to enter corresponding options again and reset it.

➤ **Load Optimal Defaults**

This menu is used to input default value in system configuration. These default values are optimized and could give play to the high capability of all hardware.

➤ **Load Failsafe Defaults**

The function of this option is to initialize the setup of each option to realize the most fundamental and secure system functional value. To implement this function, choose this option and press < Enter >; messages to be confirmed will display on the screen, press < Enter > to implement this function.

System Resource Managed by BIOS under X86 Platform

We define three kinds of system resources here: I/O port address, IRQ interrupt number and DMA number.

◆ **DMA**

Level	Function
DMA0	DRAM Refresh
DMA1	Unassigned
DMA2	Floppy Disk
DMA3	Unassigned (sometimes used for hard disk)
DMA4	Used for DMAC cascade
DMA5	Unassigned
DMA6	Unassigned
DMA7	Unassigned

◆ **APIC**

Advanced programmable interrupt controller. Most motherboards above P4 level support APIC and provide more than 16 interrupt sources, like IRQ16 - IRQ23; while some others can have up to 28 interrupt sources, such as motherboard supporting PCI-X. However, relevant OS are required to enable that function, and currently, only the OS above Windows 2000 could support that function.

◆ **IO Port Address**

There is 64K for the system I/O address space. Each external device will occupy portion of the space. The table below shows parts of the distribution of the I/O address. As the address of PCI device (e.g. PCI network card) is configured by software, it is not listed in this table.

Address	Device Description
000h - 00Fh	DMA Controller #1
020h - 021h	Programmable Interrupt Controller #1
040h - 043h	System Timer
060h - 064h	Standard 101/102 Keyboard Controller
070h - 071h	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0A1h	Programmable Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h - 0FFh	Numeric Data Processor
170h - 177h	Slave IDE
1F0h - 1F7h	Master IDE
279h、A79h	PnP Configuration Register Port
295h - 296h	Hardware Monitor
2E8h - 2EFh	COM4
2F8h - 2FFh	COM2
376h	Slave IDE (dual FIFO)
378h - 37Fh	LPT1
3B0h - 3DFh	Video Card Connector
3E8h - 3EFh	COM3
3F0h - 3F5h	Standard Floppy Disk Controller
3F6h	Master IDE(dual FIFO)
3F8h - 3FFh	COM1
0CF8h	PCI Configuration Address Register Port
0CFCh	PCI Configuration Data Read and Write Port

◆ IRQ Assignment Table

There are 15 interrupt sources of the system. Some are occupied by the system devices. Only the ones that are not occupied can be distributed. The ISA devices claim to engross the interrupt .Only the plug and play ISA devices can be distributed by the BIOS or the OS .And several PCI devices share one interrupt through the distribution of BIOS or OS. The diagram below shows parts of the interrupt distribution under X86 platform, but it does not show the interrupt source occupied by the PCI devices.

Level	Function
IRQ0	System Timer
IRQ1	Standard 101/102 Key o Microsoft Keyboard
IRQ2	Programmable Interrupt Controller
IRQ3	COM #2
IRQ4	COM #1
IRQ5	Reserved
IRQ6	Reserved
IRQ7	Reserved
IRQ8	System CMOS/Real Time Clock
IRQ9	ACPI
IRQ10	COM #4
IRQ11	COM #5
IRQ12	Reserved
IRQ13	Reserved
IRQ14	Master IDE
IRQ15	Slave IDE

Chapter 4 Install the Driver

Instructions for Video Driver

Video driver installation: operate Setup.exe under the file folder of IEGD_9_0_2_Windows\Utilities to install or uninstall.

Configure the video driver (single display or dual display): configure by IEGDGUI.exe under the file folder of IEGD_9_0_2_Windows\Utilities as well as the advanced option in display properties.

Installation Instruction of linux core 9 system

linux core 9 system can not be installed now, please contact the technical support of EVOC if you want to install it.

Please install other drivers of this product according to the equipped CD; the steps will not be introduced here.

Appendix

Watchdog Programming Guide

The board provides a programmable watchdog timer (WDT) up to 255 levels and time by minute or second. Watchdog timer overtime event can be programmed to reset system or generate maskable interrupts. The following describes WDT program in C language. Note: before operating WDT, users shall firstly enter WDT programming mode; after finishing WDT configuration, exit WDT.

The steps to program WDT are as follows:

- Enter WDT programming mode
- Setup WDT operating methods/ enable WDT/disable WDT
- Exit WDT programming mode

The following files shall be included:

```
#include <stdio.h>
#include <dos.h>
#include <bios.h>
#include <stdlib.h>
#include <string.h>
```

(1) Enter WDT programming mode

```
outportb(0x2e,0x67); //enter WDT programming mode, write 67 twice in INDEX
PORT
```

```
outportb(0x2e,0x67); //INDEX PORT [4e /2e], DATA PORT[4F/2F]
```

```
outportb(0x2e,0x07); //reg0X07, used to select logic device
```

```
outportb(0x2f,0x08); //select logic device8,
```

```
outportb(0x2e,0x30); //reg0x30, device enabling register, 0=disable, 1=enable
```

```
outportb(0x2f,0x01); //enable watchdog timer
```

(2) Setup WDT operating mode, reset mode or interrupt mode

```
outportb(0x2e, 0x70);
```

```
char oldval = inportb(0x2f);
```

a. Only Configure WDT to Reset Operating Mode

```
oldval &= 0xef; /*reg0x70.bit[4] set the bit to 0 under reset mode
```

0=WDTO

*/

outportb(0x70, oldval);

b. Configure WDT to interrupt and reset operating mode

oldval |= 0x10;

oldval |= IRQ_RESOURCE; /*reg0x70.bit[4] set this bit to 0 under reset
and interrupt mode

1=WDTO and IRQ

bit[3:0]WDT interrupt Mapping

available interrupts: 03h ~ 05h, 09h ~

0bh; the others are unavailable interrupts

03h = IRQ3

04h = IRQ4

.....

*/

outportb(0x70, oldval);

(3) WDT timer selection: time by minute or second

a. Select to time by minute with the following words:

; suppose it is under WDT programming mode

outportb(0x2e,0xf0); //select to time by minute, register 0xf0.bit[2:1]=10.

outportb(0x2f,0x04);

b. Select to time by second with the following words:

; suppose it is under WDT programming mode

outportb(0x2e,0xf0); //select to time by seconds, register 0xf0.bit[2:1]=01

outportb(0x2f,0x02);

(4) Enable/Disable WDT

; suppose it is under WDT programming mode

outportb(0x2e,0xf1);

outportb(0x2f,TIME-OUT-VALUE);

outportb(0x2e,0xf1);

outportb(0x2f,TIME-OUT-VALUE); //write the preset value TIME-OUT-VALUE

twice.

Note: the range of TIME-OUT-VALUE is from 1 to 255, the timing unit is “second” or “minute”. Write TIME-OUT-VALUE twice to the register, WDT is enabled, otherwise, it is disabled. If TIME-OUT-VALUE is zero, WDT is disabled.

(5) Exit WDT Programming Mode

Outportb (0x2e,0xaa);

GPIO Programming Guide

The board educes out 8 PINs via PCA 9534 chip; the 8 PINs are default as input in hardware; it could set its input and output via software programming. Description of the necessary constant parameters and registers in use:

PCI space: Bus: 0, Dev: 31, fun: 3; Reg: 20 ~ 23---used to read the base address of SMBUS I/O space BAR

PCA9534 address slave_adr=0x20;

Reg: 40 Bit[2] I2C_EN bit

the high 7-bit of the 8-bit address bit[7:1] is the hardware setup address 0x20, while the last bit is used to set the read and write function, bit[0]=0, write; bit[0]=1, read;

0x40:

address and write command, used to modify the value of GPIO controlling register;

0x41

address and read command, used to read the value of GPIO controlling register;

Four GPIO Controlling Register

0x00-input port (Read), when bit7 ~ bit0 are 1, its corresponding pin is active high; when bit7 ~ bit0 are 0, it is active low.

0x01-output port (Read/Write), when bit7 ~ bit0 are 1, its corresponding pin is active high; when bit7 ~ bit0 are 0, it is active low.

0x02-Polarity Inversion (Read/Write), default value is 0x00, when bit7 ~ bit0 are 1, level inverted.

0x03-Configuration (Read/Write), default value is 0xff, enable/disable output/input function, when bit7 ~ bit0 are 1, the output function of its corresponding pin is disabled and input function is enabled; when bit7 ~ bit0 are 0, the output function of its corresponding pin is enabled and input function is disabled.

5 SMBUS Registers:

BAR+Offset 0x00: HST_STS status register

BAR+Offset 0x02: HST_CNT controlling register

BAR+Offset 0x03: HST_CMD command register, Bit[7:0] used to select GPIO controlling register;

BAR+Offset 0x04: XMIL_SLAVE address register, Bit[7:0] used to write in Slave Address and read write bit;

BAR+Offset 0x05: DATA0: data register, used to store the receiving and sending data;

Program controlling flow:

1. Read base address: enter PCI configuration space to read Smbus address BAR and set I2C_EN bit to 0.
2. Write GPIO controlling register: enter Smbus I/O space, write 0xbf to HST_STS and clear status bit; set bit [4:2] of HST_CNT register to 010; write 0x40 (write command) to XMIL_SLAVE register, write GPIO controlling register 0x03 to HST_CMD, write 0x0f to DATA0, modify the value of GPIO controlling register from 0x03 to 0x0f; set GP1, 3, 5 and 7 to output and GP2, 4, 6 and 8, to input.
3. Start: set HST_CNT bit [6]START to 1, start to transmit address, command and data, read HST_STS status register in circulation; when bit [2]DEV_ERR is set to 1, indicating transmission error occurred; when bit [1]INTR is set to 1, indicating transmission complete and could implement next step.
4. Follow step 2 to modify other GPIO controlling registers.

5. Read GPIO controlling register: enter Smbus I/O space, write 0xbf to HST_STS, clear status bit, set bit[4:2] of HST_CNT register to 010, write 0x41 (read command) to XMIL_SLAVE register, write GPIO controlling register 0x00 to HST_CMD.
6. Start: set HST_CNT bit [6]START to 1, start to transmit address, command sum and read HST_ST status register in circulation, when bit [2]DEV_ERR is set to 1, indicating transmission error occurred; when bit [1]INTR is set to 1, indicating transmission completed. At that time, input register is to set the level of input pin to DATA0 register and read DATA0 register to get the level of input pin.

Set the I/O pin and high-low level according to the programming flow above.

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