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User's Manual

Single Board Computer 3307940

Version 2.0, January 2007

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1. Introduction

Thanks for choosing 3307940 PENTIUM-M Single Board Computer. The 3307940 board is a PCISA form factor board equipped with high performance processor and multi-mode I/O. It is designed for system manufacturers, integrators, or VARs that want to provide all the performance, reliability, and quality at a reasonable price.

In addition, the 3307940 has a build-in AGP4X VGA(Intel 852GM)with 3D graphics capabilities to provide up to 2048x1536x16 color resolution. The onboard VGA shares 8MB system DDR-SDRAM .

An advanced high performance super AT I/O chip – Winbond W83627HF is used in the 3307940 board. Both on-chip UARTs are compatible with the NS16C550. The parallel port and IDE interface are compatible with IBM PC/AT architecture.

The 3307940 has a built-in(ICH4) 10/100 Fast Ethernet LAN port. It is fully integrated 10BASE-T/100BASE-TX LAN solution with high performance networking functions and low power features.

The 3307940 uses the advanced Intel 852GM chipset which is 100% software compatible chipset with PCI 2.1 standard.

1.1 Specifications

CPU	● Intel Pentium-M/Celeron-M Processor ● Supports 400/533(optional) MHz FSB
Bus interface	PCI/ISA
Bus speed	ISA: 8MHZ, PCI: 33MHz,
DMA channels	7
Interrupt levels	15
Chipset	INTEL 852GM (GMCH)/855GME(optional)
Real-time clock	INTEL 82801DB(ICH4)
System memory	● One 184-pin DIMM socket ● Support DDR 200/266/333(855GME) SDRAM ● Maximum memory is up to 1GB
ATA/100 IDE interface	● Up to four PCI enhanced IDE hard drives ● Can handle data transfer up to 100MB/s ● Compatible with existing ATA IDE specifications ● There is no need to do any changes for users' current accessories
Floppy disk drive interface	Supports up to two floppy disk drives, 5.25″(360KB and 1.2MB) and/or 3.5″ (720KB, 1.44MB, and 2.88MB)
Serial ports	● COM1(RS-232) & COM2(RS-232/RS422/RS485) with 16C550 UART (or compatible) with 16-byte FIFO buffer ● Support up to 115.2Kbps ● Ports can be individually configured to COM1, COM2 or disabled
Bi-directional Parallel port	Configurable to LPT or disabled. Supports EPP/ECP/SPP
Hardware monitor	Built-in to monitor power supply voltage and fan speed status

IrDA port	Supports Serial Infrared(SIR) and Amplitude Shift Keyed IR(ASKIR) interface
USB port	Supports 5 USB2.0/1.1 ports for future expansion
Watch-dog timer	● Software programmable reset generated when CPU does not periodically trigger the timer ● The BIOS INT15 can be used to control the watchdog and generate the system reset
VGA controller	● i852GM integrated graphic engine ● Share system DDR SDRAM 8M ● Screen Resolution: up to 2048x1536x16
Ethernet	● ICH4 Fast Ethernet controllers with IEEE 802.3u Auto-Negotiation support for 10BASE-T/100BASE-TX standard ● One RJ45 connector is located on the mounting bracket for easy connection ● (The other RJ45 connector is optional)
Keyboard and PS/2 mouse connector	● A 6-pin mini-DIN connector is located on the mounting bracket for easy connection to a keyboard or PS/2 mouse ● For alternative application, a keyboard use pin header connector are also available on board
Digital input/output	● Provides 4-bit digital input and 4-bit digital output (+5V level)
Audio	AC'97 Audio CODEC
Compact flash	Can be used with a passive adapter (True IDE Mode) in a Type I/II Socket.
Power consumption	(PENTIUM-M : 1.7GHz, 1GB DDR-266 SDRAM) +5V @ 3.3 A ,+12V @ 1.7 A . Recommended : 250-watt power supply or higher
Operating temperature	$0° \sim 60°$ C

	(*CPU needs cooler & silicone heat sink paste*)

> **WARNING** ! 1. Never run the processor without the heat sink (cooler)properly and firmly attached.

1.2   Package Contents

- One 3307940 Single Board Computer
- One ATA/100 IDE cable
- One RS-232 and Printer Cable & One RS232/422/485 Cable with bracket
- One USB cable
- One Audio cable
- One PS/2 Y splitter cables for keyboard and mouse connection
- One user's manual
- One driver CD-ROM

If any of these items is missing or damaged, contact the dealer from whom you purchased this product. Save the shipping materials and carton in case you want to ship or store the product in the future.

2. Installation

This chapter describes how to install the 3307940. At first, the layout of 3307940 is shown, and the unpacking information that you should be careful is described. The jumpers and switches setting for the 3307940's configuration are also included.

2.1   Layout
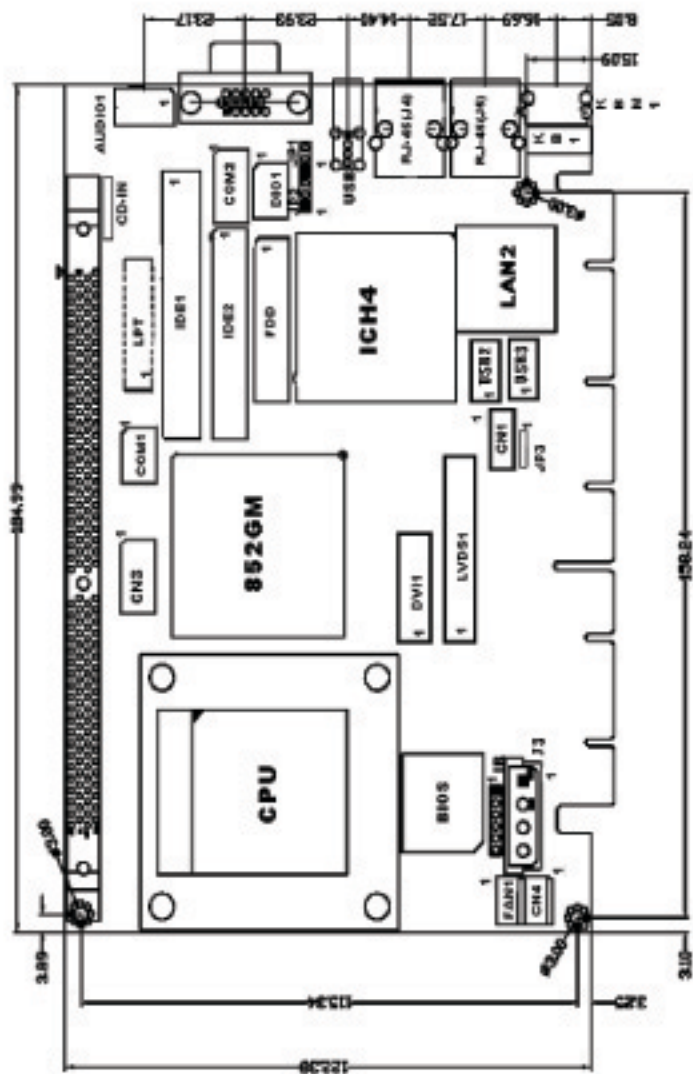
PS. Those components about LAN2 and DVI are optional.

2.2 Unpacking Precautions

Some components on PCISA-6770 SBC are very sensitive

to static electric charges and can be damaged by a sudden rush of power. To protect it from unintended damage, be sure to follow these precautions:

✓ Ground yourself to remove any static charge before touching 3307940 SBC. You can do it by using a grounded wrist strap at all times or by frequently touching any conducting materials that is connected to the ground.

✓ Handle the 3307940 SBC by its edges. Don't touch IC chips, leads or circuitry if not necessary.

✓ Do not plug any connector or jumper while the power is on.

Table of Jumpers

LABEL	FUNCTION
JP1	CMOS state setting
JP2	CompactFlash Master(1-2)/Slave(2-3) setting
JP3	LVDS LCD power source 3.3V(1-2)/5v(2-3) setting

2.3   Clear CMOS Setup

If the user wants to clear the CMOS setup , the user should close the JP1 (2-3) about 3 seconds, then open it again. Set back to normal operation mode, open JP1.

● **JP1 : Clear CMOS Setup**

JP1	DESCRIPTION
1-2	**Normal Operation**
2-3	Clear CMOS Setup

WARNING !
When you change power between ATX to AT, be sure to clear CMOS(Power ON) first .Otherwise, the CPU Board may fail to Boot up.

2.4   CompactFlash Master/Slave Mode Setting

JP2 : Master/Salve Mode Setting

JP2	DESCRIPTION
1-2	**Master**
2-3	Slave

2.5 LVDS Voltage Mode Setting

JP3 : 3.3V/5V Mode Setting

JP3	DESCRIPTION
1-2	**3.3V**
2-3	5V

3. Connection

This chapter describes how to connect peripherals, switches and indicators to the 3307940 board.

Table of Connectors

Label	Function
IDE1	Ultra ATA100 Primary (40 Pin)
IDE2	Secondary IDE connectors (44 PIN)
FDD1	Floppy connector
LPT1	Parallel port connector
DIO1	Digital I/O
COM1	Serial port connector(10 Pin)
COM2	RS-232/422/485 connector(14 PIN)
J1	Compact Flash Storage Card Type II connector
IR1	IRDA infrared interface port
USB1	USB port connector
USB2	USB dual port connector
USB3	USB dual port connector
J4	LAN1 RJ45 (10/100) connectors
J5	LAN2 RJ45(10/100/1000(optional)) connectors
KBM1	6-pin Mini-Din Keyboard & Mouse connector
KB1	External 5-pin Header Keyboard Connector
FAN1	FAN connector
CN3	External switches and indicators
CD-IN	Audio CD IN connector
CN4	Backplane to CPU board ATX power control Connector
DVI	DVI DISPLAY(Optional)
LVDS1	LVDS1 CONNECTOR
CN1	Backlight Inverter Connector

3.1 Floppy Disk Drive Connector

The 3307940 board is equipped with a 34-pin daisy-chain drive connector cable.

● FDD1 : FDC Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	2	REDUCE WRITE
3	GROUND	4	N/C
5	N/C	6	N/C
7	GROUND	8	INDEX#
9	GROUND	10	MOTOR ENABLE A#
11	GROUND	12	DRIVE SELECT B#
13	GROUND	14	DRIVE SELECT A#
15	GROUND	16	MOTOR ENABLE B#
17	GROUND	18	DIRECTION#
19	GROUND	20	STEP#
21	GROUND	22	WRITE DATA#
23	GROUND	24	WRITE GATE#
25	GROUND	26	TRACK 0#
27	GROUND	28	WRITE PROTECT#
29	N/C	30	READ DATA#
31	GROUND	32	SIDE 1 SELECT#
33	N/C	34	DISK CHANGE#

3.2 PCI E-IDE Disk Drive Connector

You can attach four IDE(Integrated Device Electronics) hard disk drives on two channels. These connectors support Ultra-DMA100 IDE devices. Non-DMA100 devices are suggested to be connecting to the secondary IDE connector.

IDE 1 : Primary IDE Connector
IDE 2 : Secondary IDE Connector

● IDE1 Interface Connector(2.54mm Pitch)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10

9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N/C
21	N/C	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	N/C	28	BALE – DEFAULT
29	N/C	30	GROUND – DEFAULT
31	INTERRUPT	32	IOCS16#-DEFAULT
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND

● **IDE2 Interface Connector (2.0mm Pitch)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N/C
21	N/C	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	N/C	28	BALE – DEFAULT
29	N/C	30	GROUND – DEFAULT
31	INTERRUPT	32	IOCS16#-DEFAULT
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND
41	VCC	42	VCC
43	GROUND	44	N/C

3.3 Parallel Port

This port is usually connected to a printer. The

3307940 includes an on-board parallel port accessed through a 26-pin flat-cable connector.

● LPT1 : Parallel Port Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	STROBE#	14	AUTO FORM FEED #
2	DATA 0	15	ERROR#
3	DATA 1	16	INITIALIZE
4	DATA 2	17	PRINTER SELECT LN#
5	DATA 3	18	GROUND
6	DATA 4	19	GROUND
7	DATA 5	20	GROUND
8	DATA 6	21	GROUND
9	DATA 7	22	GROUND
10	ACKNOWLEDGE	23	GROUND
11	BUSY	24	GROUND
12	PAPER EMPTY	26	GROUND
13	PRINTER SELECT	26	GROUND

3.4   Serial Ports

The 3307940 offers two high-speed NS16C550 compatible UART.

COM1 : 10-pin header onboard
COM2 : 14-pin header onboard

Connector	Ports	Address	Interrupt
COM1	COM1	3F8	IRQ4
COM2	COM2	2F8	IRQ3

● Serial Port 10(14)-pin Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DATA CARRIER DETECT (DCD)	2	DATA SET READY (DSR)
3	RECEIVE DATA (RXD)	4	REQUEST TO SEND (RTS)
5	TRANSMIT DATA (TXD)	6	CLEAR TO SEND (CTS)
7	DATA TERMINAL READY (DTR)	8	RING INDICATOR (RI)
9	GROUND	10	NC
(11)	RS-422 TX+ RS-485 Data+	(12)	RS-422 TX- RS-485 Data-

(13)	RS-422 RX+	(14)	RS-422 RX-

3.5 Keyboard & PS/2 Mouse Connector

A 6-pin mini DIN connector is located on the mounting bracket for easy connection to a keyboard or a PS/2 mouse. The card comes with a PS/2 Y splitter cables for keyboard and mouse connection.

● KBM1 : 6-pin Mini-DIN Keyboard Connector

PIN NO.	DESCRIPTION
1	KEYBOARD DATA
2	MOUSE DATA
3	GROUND
4	+5V
5	KEYBOARD CLOCK
6	MOUSE CLOCK

For alternative application, a keyboard and a PS/2 mouse pin header connectors are also available on board.

● KB1 : 5-pin Header Keyboard Connector

PIN NO.	DESCRIPTION
1	KEYBOARD CLOCK
2	KEYBOARD DATA
3	N/C
4	GROUND
5	+5V

3.6 External Switches and Indicators

There are several external switches and indicators for monitoring and controlling the CPU board. All the functions are in the CN3 connector.

CN3 : External Switches and Indicators

	PIN	DESCRIPTION	PIN	DESCRIPTION	
Power LED	1	+5V	2	Speaker +	
	3	GND	4	N/C	
ATX POWER BUTTON	5	BUTTON PIN1	6	N/C	Speaker
	7	BUTTON PIN2	8	Speaker -	
	9	HDD LED +	10	Reset PIN1	

HDD LED	9	HDD LED +	10	Reset PIN1	Reset Button
	11	HDD LED -	12	Reset PIN2	

3.7 PS-ON Connector

● CN4 : Backplane to CPU board Connector

PIN NO.	DESCRIPTION
1	GND
2	ATX-ON
3	5VSB

Power source from Backplane with ATX Connector (Through Power Button & +5VSB)

3.8 USB Port Connector

The 3307940 provides 2 built-in USB2.0 ports for the future I/O bus expansion.

USB2&USB3			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GROUND
3	DATA0-	4	DATA1+
5	DATA0+	6	DATA1-
7	GROUND	8	VCC

3.9 IrDA Infrared Interface Port

The 3307940 has a built-in IrDA port which supports Serial Infrared (SIR) or Amplitude Shift Keyed IR (ASKIR) interface. If you want to use the IrDA port, you have to configure SIR or ASKIR model in the BIOS under Peripheral Setup COM2. Then the normal RS-232 COM 2 will be disabled.

● IR1: IrDA connector

PIN NO.	DESCRIPTION
1	VCC
2	NC
3	IR-RX
4	Ground
5	IR-TX
6	NC

3.10 Fan Connectors (FAN1)

The 3307940 provides two CPU cooling fan connectors, These connectors can supply 12V/500mA to the cooling fan. All connectors have the same pin assignments and provide a "rotation" pin to get rotation signals from fans and notice the system. So the system BIOS can recognize the fan speed. Please note that only specified fan can issue the rotation signals.

● **Fan Connector**

PIN NO.	DESCRIPTION
1	GROUND
2	+12V
3	Rotation Signal

3.11 AUDIO Connector

The 3307940 has a built-in AC'97 AUDIO CODEC connector directly connects to the pin-header (AUDIO1).

AUDIO1			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SPEAK(L)	2	SPEEAK(R)
3	GND	4	GND
5	LINE_OUT(L)	6	LINE_OUT(R)
7	LINEIN(L)	8	LINEIN(R)
9	GND	10	GND
11	MIC	12	GND

CDIN1 : CD-IN

PIN NO.	DESCRIPTION
1	CD LEFT SIGNAL
2	GROUND
3	GROUND
4	CD RIGHT SIGNAL

3.12 External Power Connector (J3)

The 3307940 has an onboard external power connector J3. You can apply power directly to the CPU board.

● **J3:External Power Connector**

PIN NO.	DESCRIPTION
1	+5V
2	GROUND
3	GROUND
4	+12V

3.13 Digital I/O Connector

One characteristic of digital circuit is its fast response to high or low signal. This kind of response is highly needed for harsh and critical industrial operating environment. That's why we design 4-bit digital inputs and 4-bit digital outputs on the 3307940 Digital Input and Output, generally, are control signals. You can use these signals to control external devices that needs On/Off circuit or TTL devices.

• DIO1: Digital I/O

DIO1			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+5V
3	OUT0	4	OUT1
5	OUT2	6	OUT3
7	IN0	8	IN1
9	IN2	10	IN3

3.14 DVI (Optional)

The 3307940 provides DVI interface for your DVI display.

• DVI1 : DVI Connector

PIN	DESCRIPTION	PIN	DESCRIPTION
1	DATA2-	14	V_{CC}
2	DATA2+	15	GND
3	GND	16	HP_DET
4	NC	17	DATA0-
5	NC	18	DATA0+
6	DDCCLK	19	GND
7	DDCDATA	20	NC
8	NC	21	NC
9	DATA1-	22	GND-
10	DATA1+	23	CLK+

11	GND	24	CLK-
12	NC	25	GND
13	NC		

3.15 LVDS1 CONNECTOR

● LVDS1 **: LVDS Connector**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	16	LVDSB_Y3-
2	GND	17	LVDSB_CLK+
3	LVDS_Y3+	18	LVDSB_CLK-
4	LVDS_Y3-	19	LVDSB_Y2+
5	LVDS_CLK+	20	LVDSB_Y2-
6	LVDS_CLK-	21	LVDSB_Y1+
7	LVDS_Y2+	22	LVDSB_Y1-
8	LVDS_Y2-	23	LVDSB_Y0+
9	LVDS_Y1+	24	LVDSB_Y0-
10	LVDS_Y1-	25	GND
11	LVDS_Y0+	26	GND
12	LVDS_Y0-	27	VCC_LCD
13	GND	28	VCC_LCD
14	GND	29	VCC_LCD
15	LVDSB_Y3+	30	VCC_LCD

3.16 Compact Flash Storage Card Socket (J1)

The 3307940 configures Compact Flash Storage Card in IDE Mode. This type II Socket is compatible with IBM Micro Drive.

● **J1 : Compact Flash Storage Card Socket pin assignment**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	26	PULL DOWN
2	D3	27	D11
3	D4	28	D12
4	D5	29	D13
5	D6	30	D14
6	D7	31	D15
7	CS1#	32	CS3#
8	N/C	33	N/C

9	GROUND	34	IOR#
10	N/C	35	IOW#
11	N/C	36	VCC
12	N/C	37	IRQ15
13	VCC	38	VCC
14	N/C	39	MASTER/SLAVE
15	N/C	40	N/C
16	N/C	41	RESET#
17	N/C	42	IORDY
18	A2	43	N/C
19	A1	44	VCC
20	A0	45	ACTIVE#
21	D0	46	PDIAG#
22	D1	47	D8
23	D2	48	D9
24	N/C	49	D10
25	PULL DOWN	50	GROUND

3.17 Backlight inverter Connector

CN1: backlight inverter connector

PIN NO.	DESCRIPTION
1	NC
2	GROUND
3	BKL_POWER
4	GROUND
5	VCC

Appendix A.   WatchDog Timer

The WatchDog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, hardware on the board will either perform a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the WatchDog Timer:

INT 15H:

AH − 6FH
Sub-function:
AL − 2 : Set the Watchdog Timer's period
BL   : Time-out value(Its unit--second or minute, is dependent on the item "WatchDog Timer unit select" in CMOS setup).

You have to call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer will start counting down. While the timer value reaches zero, the system will reset. To ensure that this reset condition does not occur, the WatchDog Timer must be periodically refreshed by calling sub-function 2. However the Watchdog timer will be disabled if you set the time-out value to be zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

Example program:

```
;  INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

      MOV    AX, 6F02H          ; setting the time-out value
      MOV    BL, 30             ; time-out value is 48 seconds
      INT    15H
;
;  ADD YOUR APPLICATION PROGRAM HERE
;
      CMP    EXIT_AP, 1         ; is your application over?
      JNE    W_LOOP            ; No, restart your application

      MOV    AX, 6F02H          ; disable Watchdog Timer
      MOV    BL, 0              ;
      INT    15H
;
;  EXIT
;
```

Appendix B: Digital I/O

One characteristic of digital circuit is its fast response to high or low signal. This kind of response is highly needed for harsh and critical industrial operating environment. That's why we design 4-bit digital inputs and 4-bit digital outputs on the 3307940. Digital Input and Output, generally, are control signals. You can use these signals to control external devices that needs On/Off circuit or TTL devices. You can read or write data to the selected address to enable the function of digital IO.

A BIOS function call (INT 15H) is used to control Digital I/O:

INT 15H:

AH – 6FH
Sub-function:
AL – 8: Set the Digital port is INPUT
AL   : Digital I/O input value

Example program:

```
     MOV    AX, 6F08H             ;setting the Digital port is
input
     INT    15H                   ;
```

AL low byte = value

AH – 6FH
Sub-function:
AL – 9: Set the Digital port is OUTPUT
BL   : Digital I/O output value

Example program:

```
     MOV    AX, 6F09H             ;setting the Digital port is
output
     MOV    BL, 09H               ;Digital value is 09H
     INT    15H                   ;
```

Digital Output is 1001b

Appendix C.   Resources Map

1 st MB Memory Address Map

Memory address	Description
00000-9FFFF	SYSTEM MEMORY
A0000-BFFFF	VGA BUFFER
C0000-CFFFF	VGA BIOS
E0000-FFFFF	SYSTEM BIOS
100000	EXTEND MEMORY

IRQ Mapping Chart

IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	SCI IRQ user by ACPI bus
IRQ2	IRQ Controller	IRQ10	INTEL Network connection
IRQ3	COM2	IRQ11	ICH4 USB2.0 / AC97 audio
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	ACPI for PCI IRQ	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Printer	IRQ15	Secondary IDE

DMA Channel Assignment

Channel	Function
0	Available
1	Available
2	Floppy disk
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

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

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