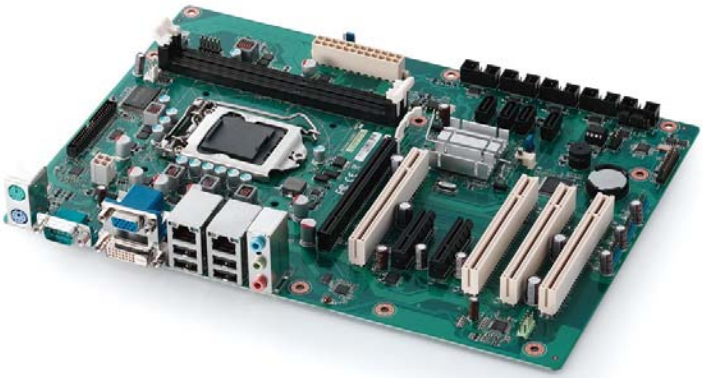
IMB-M40H

ATX Intel® Core™ i7/i5/i3
Industrial Motherboard

User's Manual



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Revision History

Revision	Release Date	Description of Change(s)
1.00	2013/7/31	Preliminary release

Preface

Disclaimer

The information in this document is subject to change without prior notice in order to improve reliability, design, and function and does not represent a commitment on the part of the manufacturer.

In no event will the manufacturer be liable for direct, indirect, special, incidental, or consequential damages arising out of the use or inability to use the product or documentation, even if advised of the possibility of such damages.

Environmental Responsibility

ADLINK is committed to fulfill its social responsibility to global environmental preservation through compliance with the European Union's Restriction of Hazardous Substances (RoHS) directive and Waste Electrical and Electronic Equipment (WEEE) directive. Environmental protection is a top priority for ADLINK. We have enforced measures to ensure that our products, manufacturing processes, components, and raw materials have as little impact on the environment as possible. When products are at their end of life, our customers are encouraged to dispose of them in accordance with the product disposal and/or recovery programs prescribed by their nation or company.

Trademarks

Product names mentioned herein are used for identification purposes only and may be trademarks and/or registered trademarks of their respective companies.

Using this Manual

Audience and Scope

The IMB-M40H User's Manual is intended for hardware technicians and systems operators with knowledge of installing, configuring and operating industrial grade systems.

Manual Organization

This manual is organized as follows:

Preface: Presents important copyright notifications, disclaimers, trademarks, and associated information on the proper understanding and usage of this document and its associated product(s).

Chapter 1, Introduction: Introduces the IMB-M40H, its features, applications, and specifications, including functional descriptions and board layout.

Chapter 2, Hardware Information: Provides technical information on connectors and jumpers for configuring the IMB-M40H.

Chapter 3, Getting Started: Illustrates how to install components on the IMB-M40H such as CPU, heatsink, and memory modules.

Chapter 4, Driver Installation: Provides information on how to install the IMB-M40H device drivers.

Important Safety Instructions: Presents safety instructions all users must follow for the proper setup, installation and usage of equipment and/or software.

Getting Service: Contact information for ADLINK's worldwide offices.

Conventions

Take note of the following conventions used throughout this manual to make sure that users perform certain tasks and instructions properly.

NOTE:

Additional information, aids, and tips that help users perform tasks.

CAUTION:

Information to prevent ***minor*** physical injury, component damage, data loss, and/or program corruption when trying to complete a task.

WARNING:

Information to prevent ***serious*** physical injury, component damage, data loss, and/or program corruption when trying to complete a specific task.

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1 Introduction

1.1 Overview

The ADLINK IMB-M40H is an ATX industrial motherboard supporting the 3rd Generation Intel® Core™ i7/i5/i3 and Pentium® processors in LGA1155 package to deliver a scalable high performance platform for a wide array of industrial applications. The IMB-M40H supports 22nm process CPUs at up to 3.4 GHz with integrated graphics and memory controllers, Direct Media Interface (DMI) and Flexible Display Interface (FDI) connectivity to the Intel® H61 Express Chipset. Dual-channel DDR3 1333/1600 MHz memory is supported up to a maximum of 16 GB in two DIMM slots.

These advanced features, coupled with integrated graphics, one PCI Express x16 slot, two PCI Express x1 slots, four PCI slots, dual PCI Express-based Gigabit Ethernet, SATA 3 Gb/s and audio interfaces make the IMB-M40H ideal for automation control, medical, test & measurement, and telecom applications requiring a high-performance, easy-to-deploy and reliable mainboard.

1.2 Features

- ATX form factor (305 mm x 218 mm)
- Supports 3rd Generation Intel® Core™ i7/i5/i3 and Pentium® processors in LGA1155 package
- Integrated Intel® HD Graphics
- One PCIe x16 slot, two PCIe x4 slots (with PCIe x1 signals), four PCI slots
- Dual Gigabit Ethernet
- 10x USB 2.0 ports (6x onboard, 4x on faceplate)
- 4x SATA 3 Gb/s ports
- VGA, DVI-D
- 5x RS-232 + 1x RS-232/422/485
- Watchdog Timer, Hardware Monitor
- Realtek ALC892 HD audio codec
- 16in+16out DIO
- 2x Mini-DIN for PS/2 keyboard/mouse
- RoHS compliant

1.3 Specifications

System	
CPU	Intel® Core™ (LGA115) • Intel® Core™ i7-3770, 3.40 GHz, 8M Cache, 22nm, 77W TDP (4C) • Intel® Core™ i5-3550S, 3.0 GHz, 6M Cache, 22nm, 65W TDP (4C) • Intel® Core™ i3-3220, 3.30 GHz, 3M Cache, 22nm, 55W TDP (2C) • Intel® Pentium® G2120, 3.10 GHz, 3M Cache, 22nm, 55W TDP (2C) • Intel® Celeron® G1620, 2.7 GHz, 2M Cache, 22nm, 55W TDP (2C) • Intel® Celeron® G540, 2.5 GHz, 2M Cache, 32nm, 65W TDP (2C) • Intel® Pentium® Dual Core G850, 2.9 GHz, 3M Cache, 32nm, 65W TDP (2C)
Chipset	Intel® H61 Express Chipset
Memory	2x 240-pin DIMM sockets Dual-channel DDR3 1333/1600 MHz (up to 16 GB)
BIOS	AMIBIOS in 32-Mbit SPI Flash
Audio	Realtek ALC892 HD codec Supports line-in, line-out and mic-in
Watch Dog Timer	1-255 second or 1-255 minute programmable and can generate system reset.
Hardware Monitor	CPU/System temperature, CPU fan speed and onboard DC voltage
Operating Systems	• Windows XP, 7, 32/64-bit • Fedora 17 • Red Hat Enterprise Linux 6.2
I/O Interfaces	
Serial ATA	• 4x SATA 3 Gb/s ports
Onboard I/O	• 3x USB 2.0 pin headers (6 ports) • 5x RS-232 + 1x RS-232/422/485 (COM6) • 16in+16out DIO ports • 1x front panel pin header
Rear I/O	• 2x Gigabit Ethernet RJ45 ports • 4x USB 2.0 ports • 1x VGA connector • 1x DVI-D port • 2x PS2 keyboard/mouse ports • 3x audio jacks (line-in, line-out and mic-in)

Table 1-1: IMB-M40H General Specifications

Expansion Slots	• 1x PCIe-x16 Gen 2 • 2x PCIe x4 slot (with PCIe x1 signal) • 4x PCI slots
Display	
Graphics	Integrated Intel® HD Graphics
VGA	Dsub-15 connector, up to 2048x1536 @ 75 Hz
DVI-D	DVI-D connector, up to 1920x 1200 @ 60 Hz
Ethernet	
Controller	• Dual Gigabit Ethernet (Realtek® 8111E Gigabit Ethernet Controller) • Supports Preboot Execution Environment (PXE), Wake-On-LAN
Ports	Two RJ-45 Ethernet ports
Mechanical and Environment	
Form Factor	ATX Industrial Motherboard
Dimensions	305 mm x 218 mm (L x W)
Operating Temp.	0ºC to 60ºC
Storage Temp.	-20ºC to 80ºC
Rel. Humidity	10% to 90% non-condensing
Safety	CE, FCC Class A

Table 1-1: IMB-M40H General Specifications

1.4 Block Diagram

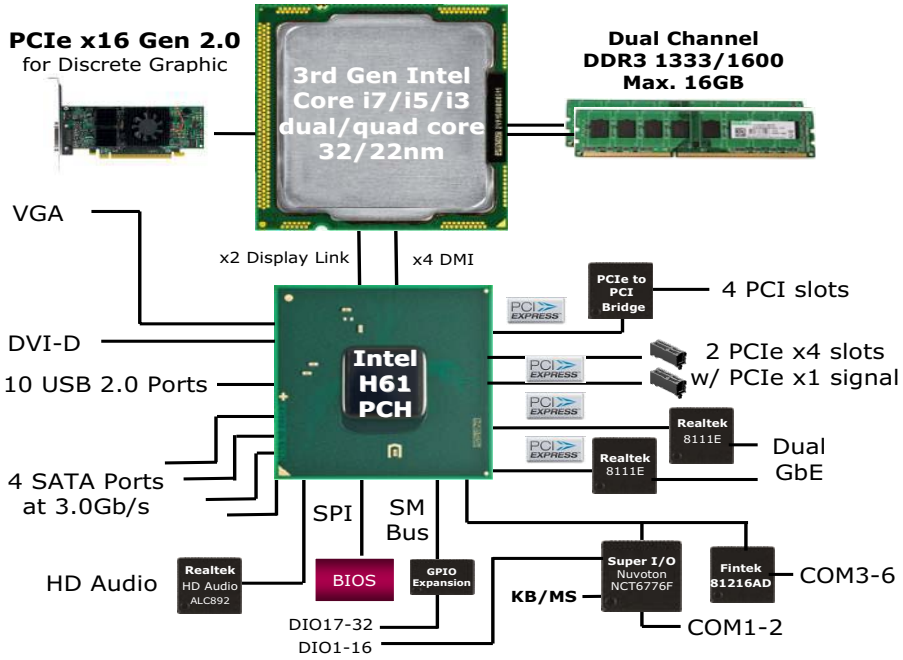


Figure 1-1: IMB-M40H Block Diagram

1.5 Functional Description

Processor Support

The IMB-M40H is an industrial motherboard supporting the 3rd generation Intel® Core™ processor family (Intel® Core™ i7/i5/i3) in LGA1155 socket. An integrated memory controller supports dual channel DDR3 1333/1600 MHz and Intel® HD Graphics is integrated onboard the CPU. The CPU provides a PCI Express x16 for external graphics or expansion. Direct Media Interface (DMI) and Flexible Display Interface (FDI) provide connectivity to the Intel® H61 Express Chipset.

Intel® H61 Express Chipset

The Intel® BD82H61 Platform Controller Hub (PCH) combines with the processor to provide a compact yet powerful 2-chip solution. Direct Media Interface (DMI) is the chip-to-chip connection between the processor and PCH. Intel® Flexible Display Interface carries display traffic from the integrated graphics in the processor to the legacy display connectors in the PCH. The PCH supports all other required interfaces including PCI Express, SATA 3 Gb/s, USB 2.0, PCI, LPC, and SPI.

Dual-Channel DDR3 Memory

To meet the requirements of memory-intensive applications, the IMB-M40H has a dual-channel memory architecture supporting DDR3 1333/1600 MHz DIMMs. The key advantages of DDR3 are the higher bandwidth and the increase in performance at lower power than DDR2. DDR3 memory technology meets the requirements of the latest 3D graphics, multimedia, and network application, and boosts system performance by eliminating bottlenecks.

Gigabit Ethernet

The IMB-M40H utilizes two Realtek® RTL8111E Gigabit Ethernet Controllers connected to the PCI-E bus of the H61 PCH. Wake-on-LAN and PXE are supported.

Serial ATA

The IMB-M40H provides four SATA 3 GB/s ports.

Hardware monitoring

A built-in, proactive hardware monitoring system in the Super I/O monitors the CPU temperature, CPU fan speed, and voltage levels to prevent overheating and/or component damage, effect timely failure detection, and ensure stable supply of current for critical components.

Watchdog Timer

The watchdog timer (WDT) monitors system operations based on user-defined configurations. The WDT can be programmed for different time-out periods, such as from 1 to 255 seconds or from 1 to 255 minutes. The WDT generates a reset signal, then a reset request, after failure to strobe it within the programmed time period. A register bit may be enabled to indicate if the watchdog timer caused the reset event. The WDT register is cleared during the power-on sequence to enable the operating system to take appropriate action when the watchdog generates a reboot.

1.6 Power Consumption

Test Configuration	
Memory	2x Transcend 8GB DDR3 1600 DIMM (CL11 SEC K4B4G0846B-HYK0 8GB)
Graphics	Intel® Graphics Media Accelerator HD (integrated)
Storage	Seagate ST9160412AS Momentus 7200.4 160GB
Power Supply	Sunpower SPX-6500P1 500W

Intel® Core™ i7-3770 Processor (8M Cache, 3.40 GHz)

S1				
Power Req.	+5V	+12V	+3.3V	Total
Current (A)	0.64	1.04	0.46	—
Power (W)	3.2	12.48	1.52	17.20
Idle Load				
Power Req.	+5V	+12V	+3.3V	Total
Current (A)	1.32	0.59	0.50	—
Power (W)	6.6	7.08	1.65	15.33
CPU Max				
Power Req.	+5V	+12V	+3.3V	Total
Current (A)	1.35	8.00	0.82	—
Power (W)	6.75	96.0	2.71	105.45
Max. Load				
Power Req.	+5V	+12V	+3.3V	Total
Current (A)	1.76	7.41	0.65	—
Power (W)	8.8	88.92	2.14	99.86

Table 1-2: Core™ i7-3770 Power Consumption

Intel® Core™ i3-3220 Processor (3M Cache, 3.30 GHz)

S1				
Power Req.	+5V	+12V	+3.3V	Total
Current (A)	0.64	0.92	0.38	—
Power (W)	3.2	11.04	1.25	15.49
Idle Load				
Power Req.	+5V	+12V	+3.3V	Total
Current (A)	1.15	0.56	0.50	—
Power (W)	5.75	6.72	1.65	14.12
CPU Max				
Power Req.	+5V	+12V	+3.3V	Total
Current (A)	1.20	3.24	0.73	—
Power (W)	6.0	38.88	2.41	47.29
Max. Load				
Power Req.	+5V	+12V	+3.3V	Total
Current (A)	2.13	2.74	0.72	—
Power (W)	10.65	32.88	2.37	45.90

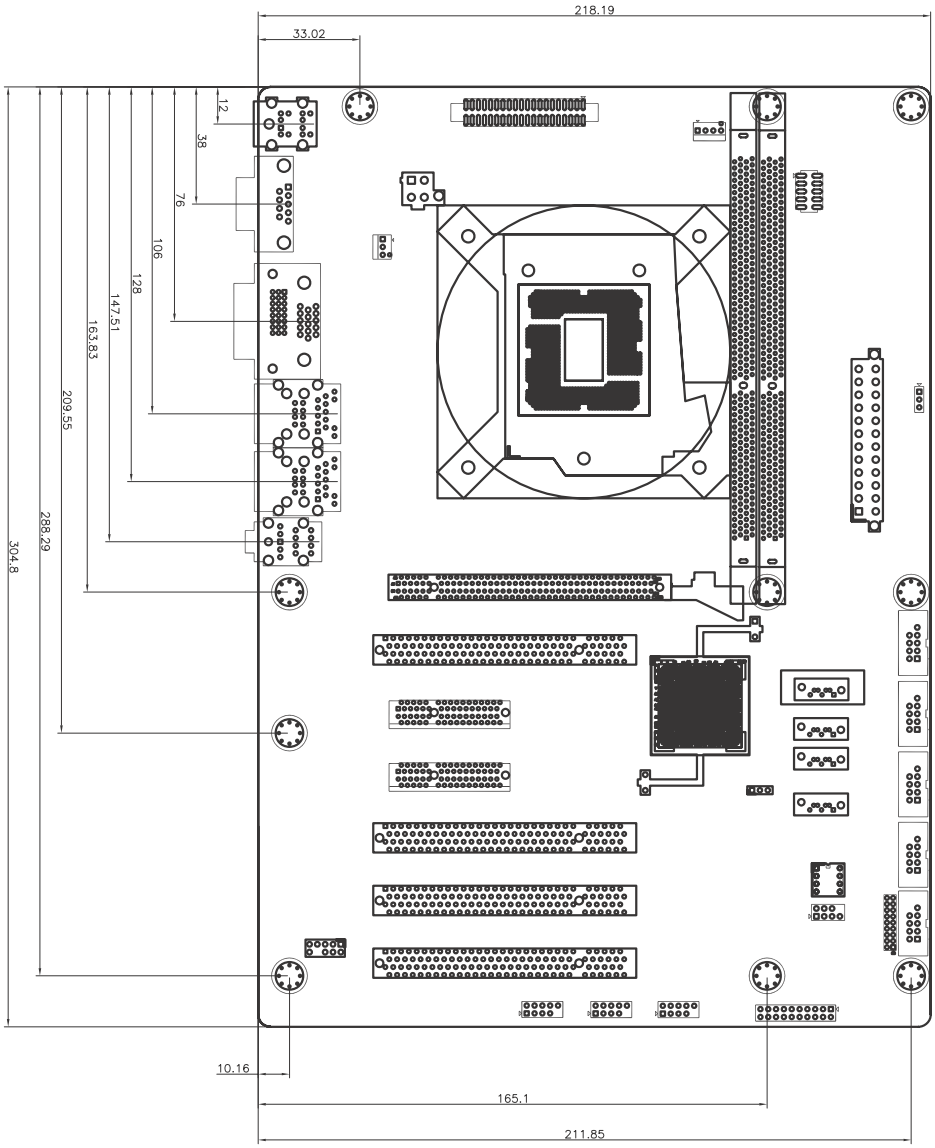
Table 1-3: Core™ i3-3220 Power Consumption

Intel® Pentium® Processor G2120 (3M Cache, 3.10 GHz)

S1				
Power Req.	+5V	+12V	+3.3V	Total
Current (A)	0.64	0.72	0.38	—
Power (W)	3.2	8.64	1.25	13.09
Idle Load				
Power Req.	+5V	+12V	+3.3V	Total
Current (A)	1.21	0.57	0.48	—
Power (W)	6.05	6.84	1.58	14.47
CPU Max				
Power Req.	+5V	+12V	+3.3V	Total
Current (A)	1.23	2.72	0.55	—
Power (W)	6.15	32.64	1.81	40.60
Max. Load				
Power Req.	+5V	+12V	+3.3V	Total
Current (A)	1.85	2.30	0.73	—
Power (W)	9.25	27.6	2.41	39.26

Table 1-4: Pentium® G2120 Power Consumption

1.7 Mechanical Drawings



Dimensions in mm

Figure 1-2: IMB-M40H Board Dimensions

1.8 Package Contents

Before unpacking, check the shipping carton for any damage. If the shipping carton and/or contents are damaged, inform your dealer immediately. Retain the shipping carton and packing materials for inspection. Obtain authorization from the dealer before returning any product to ADLINK.

- IMB-M40H ATX Industrial Motherboard
- I/O shield
- SATA cable x2
- Driver DVD
- Quick Reference Guide

The IMB-M40H must be protected from static discharge and physical shock. Never remove any of the socketed parts except at a static-free workstation. Use the anti-static bag shipped with the product to handle the board. Wear a grounded wrist strap when installing and/or servicing.

2 Hardware Information

2.1 Rear I/O Connectors

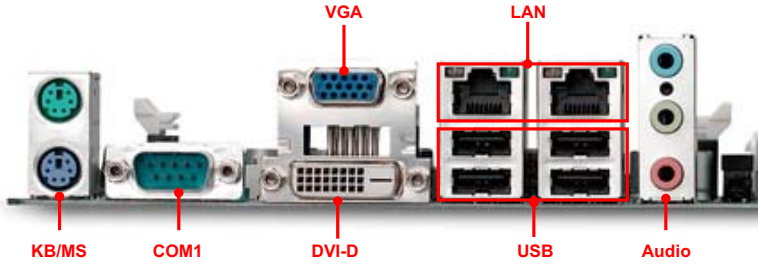
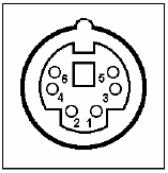


Figure 2-1: IMB-M40H Rear I/O Layout

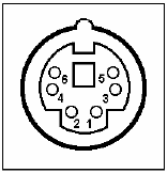
PS/2 Mouse Port (green)

Pin #	Signal	Function
1	MSDATA	Mouse Data
2	NC	not connected
3	GND	Ground
4	+5V	Power
5	CLK	Clock
6	NC	not connected



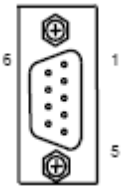
PS/2 Keyboard Port (purple)

Pin #	Signal	Function
1	KBDATA	Keyboard Data
2	NC	not connected
3	GND	Ground
4	+5V	Power
5	CLK	Clock
6	NC	not connected

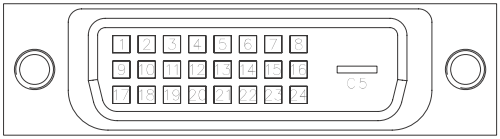


Serial Port Connector (COM1)

Pin #	RS-232
1	DCD, Data Carrier Detect
2	RXD, Receive Data
3	TXD, Transmit Data
4	DTR, Data Terminal Ready
5	GND, ground
6	DSR, Data Set Ready
7	RTS, Request to Send
8	CTS, Clear to Send
9	RI, Ring Indicator



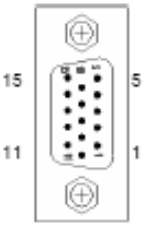
DVI-D Connector



Pin #	Signal	Pin #	Signal
1	TMDS Data2-	16	Hot Plug Detect
2	TMDS Data2+	17	TMDS Data0-
3	TMDS Data2 Shield	18	TMDS Data0+
4	NC	19	TMDS Data0 Shield
5	NC	20	NC
6	DDC Clock	21	NC
7	DDC Data	22	GND
8	NC	23	TMDS Clock Shield
9	TMDS Data1-	24	TMDS Clock +
10	TMDS Data1+	C1	NC
11	TMDS Data1 Shield	C2	NC
12	NC	C3	NC
13	NC	C4	NC
14	P5V	C5	GND
15	GND		

VGA Connector.

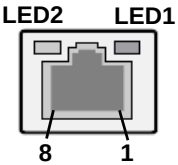
Signal Name	Pin #	Pin #	Signal Name
Red	1	2	Green
Blue	3	4	VCC pull-up
GND	5	6	GND
GND	7	8	GND
VCC	9	10	GND
VCC pull-up	11	12	DDC2B DATA
HSYNC	13	14	VSYNC
DDC2B CLK	15		



LAN Port (RJ-45)

Refer to the tables below for the LAN port pin and LED definitions.

Pin #	10BASE-T/ 100BASE-TX	1000BASE-T
1	TX+	BI_DA+
2	TX-	BI_DA-
3	RX+	BI_DB+
4	--	BI_DC+
5	--	BI_DC-
6	RX-	BI_DB-
7	--	BI_DD+
8	--	BI_DD-



LED1 (Activity/Link)		LED2 (Speed)	
Status	Description	Status	Description
Off	No Link	Off	10 Mb connection
Orange	Linked	Orange	100 Mb connection
Blinking	Data Activity	Green	1 Gb connection

USB Connectors

Pin #	Signal Name
1	Vcc
2	USB-
3	USB+
4	GND

Audio I/O port

The three-jack audio I/O supports Line-In, Line-Out, and Mic-In functions. The blue Line-In jack connects to an audio source such as a CD player. The green Line-Out port connects to a speaker or headphone, while the pink Mic-In jack connects to a microphone.

2.2 Board Layout

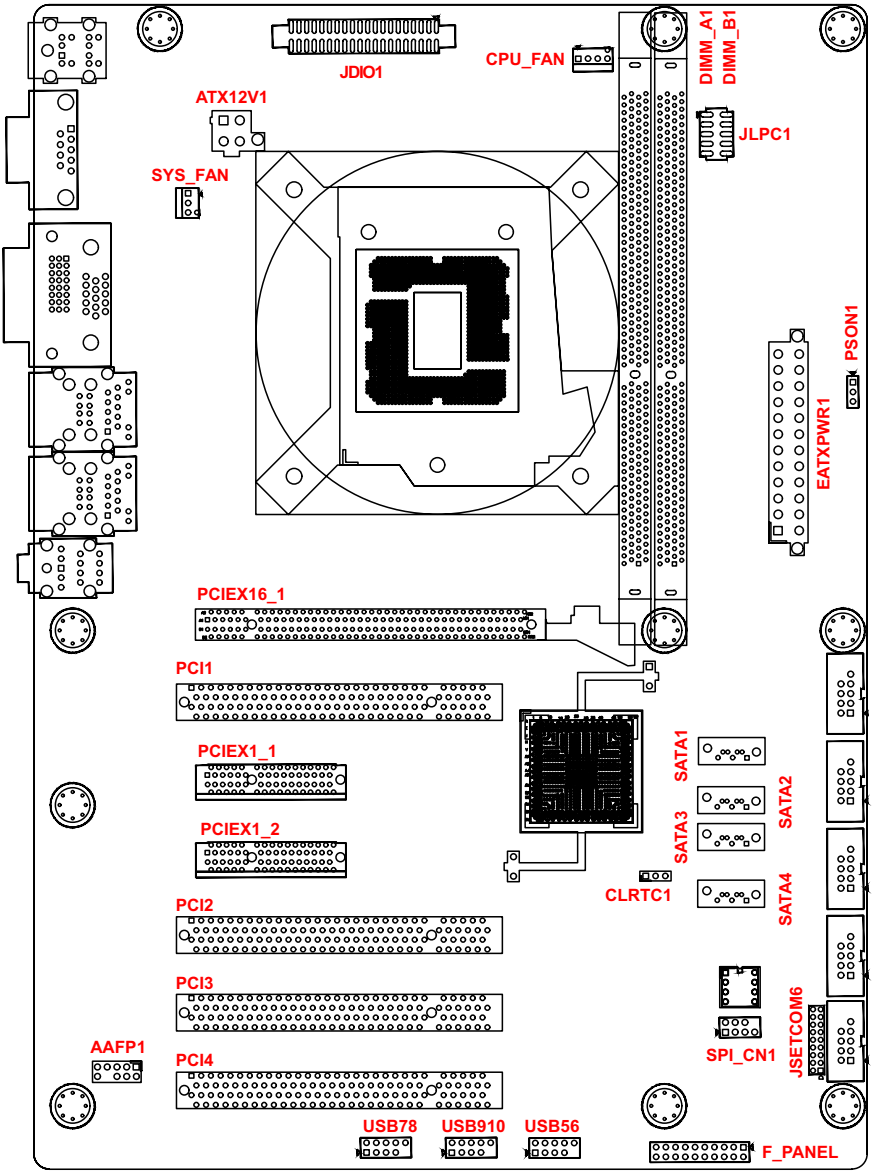


Figure 2-2: IMB-M40H Board Layout

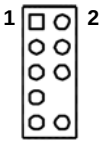
AAFP1	Front Panel Audio Header
ATX12V1	ATX 12V Power Connector
DIMM_A1/B1	240-pin DIMM slots
EATXPWR1	ATX Power Connector
CLRTC1	Clear CMOS Jumper
COM2~6	Serial Port Connectors 2~6
CPU_FAN	CPU Fan Connector
F_PANEL	System Panel Pin Header
JDIO1	Digital IO Connector
JLPC	LPC Pin Header
JSETCOM6	COM6 Mode Jumpers
PCIEX1_1/2	PCI Express x1 slots
PCIEX16_1	PCI Express x16 slot
PCI1~4	PCI slots
PSON1	AT/ATX Mode Jumper
SATA1~4	SATA 3 Gb/s Connector
SPI_CN1	SPI Pin Header
SYS _FAN	System Fan Connector
USB56/78/910	USB 2.0 Pin Headers

Table 2-1: IMB-M40H Board Layout Legend

2.3 Onboard Connectors & Jumpers

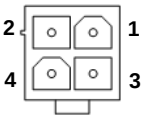
Front Panel Audio Pin Header (AAFP1)

Pin #	Signal	Pin #	Signal
1	MIC2_L	2	AGND
3	MIC2_R	4	FP_PRES#
5	LIN2_R	6	SRTN1
7	SENSE A	8	NC
9	LIN2_L	10	SRTN2



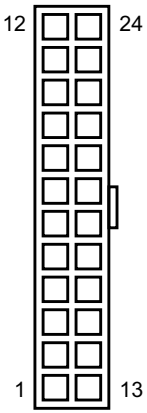
ATX 12V Power Connector (ATX12V1)

Pin #	Signal
1	GND
2	GND
3	+12V DC
4	+12V DC



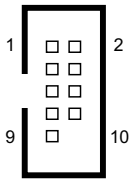
ATX Power Connector (EATXPWR1)

Pin #	Signal	Pin #	Signal
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS-ON#
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	PWRGD	20	NC
9	+5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND



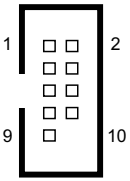
Serial Port Connectors - RS-232 (COM2~6)

Pin #	Signal	Function
1	DCD	Data Carrier Detect
2	DSR	Data Set Ready
3	RXD	Receive Data
4	RTS	Request to Send
5	TXD	Transmit Data
6	CTS	Clear to Send
7	DTR	Data Terminal Ready
8	RI	Ring Indicate
9	GND	Ground
10	NC	Key



Serial Port Connector - RS-422/485 (COM6)

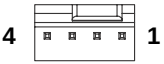
Pin #	RS-422	RS-485
1	TX-	DATA-
2	N/A	N/A
3	TX+	DATA+
4	N/A	N/A
5	RX+	N/A
6	N/A	N/A
7	RX-	N/A
8	N/A	N/A
9	GND	GND
10	Key	Key



See "COM6 Mode Jumper Settings (JSETCOM6)" on page 24.

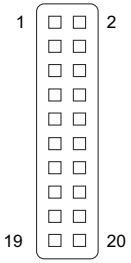
CPU Fan Connector (CPU__FAN)

Pin #	Signal
1	GND
2	Fan power (+12V)
3	Fan Tachometer
4	Fan Speed Control



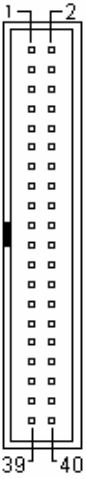
System Panel Pin Header (F_PANEL)

Pin #	Signal	Function	Pin Group
1	WDSPK	Speaker signal	Chassis Speaker
3	NC		
5	NC		
7	P5V	Power	
9	NC		
11	GND	Ground	Key Lock
13	KEYLOCK	Keyboard lock	
15	PLED	Power LED signal	Power LED
17	NC		
19	P5V	Power LED pull-up	
2	GND	Ground	RESET Button
4	RESETBT	RESET signal	
6	NC		
8	GND	Ground	Power On Button
10	POWERBT	Power-on signal	
12	NC		
14	NC		
16	HDDLED	Hard Disk LED signal	Hard Disk LED
18	P3V3	Hard Disk LED pull-up	
20	NC		



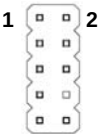
Digital IO Connector (JDIO1)

Pin #	Signal	Pin #	Signal
1	SIO_GPIO0	2	DIO_GPIO0
3	SIO_GPIO1	4	DIO_GPIO1
5	SIO_GPIO2	6	DIO_GPIO2
7	SIO_GPIO3	8	DIO_GPIO3
9	SIO_GPIO4	10	DIO_GPIO4
11	SIO_GPIO5	12	DIO_GPIO5
13	SIO_GPIO6	14	DIO_GPIO6
15	SIO_GPIO7	16	DIO_GPIO7
17	SIO_GPIO8	18	DIO_GPIO8
19	SIO_GPIO9	20	DIO_GPIO9
21	SIO_GPIO10	22	DIO_GPIO10
23	SIO_GPIO11	24	DIO_GPIO11
25	SIO_GPIO12	26	DIO_GPIO12
27	SIO_GPIO13	28	DIO_GPIO13
29	SIO_GPIO14	30	DIO_GPIO14
31	SIO_GPIO15	32	DIO_GPIO15
33	SMB_CLK_RESUME	34	SMB_DATA_RESUME
35	GND	36	+5V_DUAL
37	GND	38	+5V_DUAL
39	GND	40	+5V_DUAL



LPC Pin Header (JLPC)

Pin #	Signal	Pin #	Signal
1	V3.3	2	GND
3	BIOS_DISABLE#	4	LPC_AD3
5	PRST_SIO	6	LPC_AD2
7	CLK33M_LPC	8	LPC_AD1
9	LPC_FRAME#	10	LPC_AD0

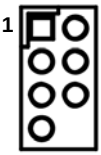


SATA Connectors (SATA1~4)

Pin #	Signal
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

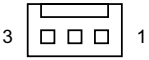
SPI Pin Header (SPI_CN1)

Pin #	Signal	Pin #	Signal
1	+3V ROM	2	GND
3	F_SPI_CS#	4	F_SPI_CLK
5	F_SPI_MISO	6	F_SPI_MOSI
7	SPI_HOLD#	8	NC



System Fan Connector (SYS_FAN)

Pin #	Signal
1	GND
2	Fan Power (+12V)
3	Fan Tachometer



USB 2.0 Pin Headers (USB56/78/910)

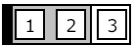
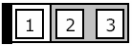
Pin #	Signal	Pin #	Signal
1	+5V	2	+5V
3	USB0-	4	USB1-
5	USB0+	6	USB1+
7	GND	8	GND
9	Key	10	NC

2.4 Jumpers

Clear CMOS (CLRTC1)

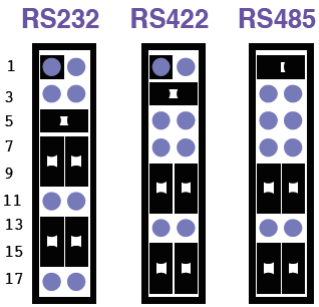
The CMOS RAM data contains the date / time and BIOS setting information. CMOS is powered by the onboard button cell battery. To erase the CMOS RAM data:

1. Power down and disconnect power from the system.
2. Short pins 2-3 on JP1.
3. Reconnect power and power up the system.
4. After power up, remove the jumper cap from pins 2-3 and reinstall it to pins 1-2.

RTC status	Connection	CLCMOS
Normal	1 – 2	
Clear CMOS	2 – 3	

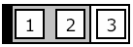
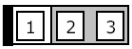
COM6 Mode Jumper Settings (JSETCOM6)

Short the jumper pins according to the following settings to set COM6 to RS-232/422/485 mode:



AT/ATX Mode Jumper (PSON1)

Pin #	Signal
1	PSON_AT
2	FRP_PANSWUN
3	NC

Status	Connection	JCLRT_C2
AT Mode	1 – 2	
ATX Mode	2 – 3 (default)	

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3 Getting Started

This chapter provides information on how to install components on the IMB-M40H motherboard.

3.1 Installing the CPU

The IMB-M40H supports an Intel® Core™ i7/i5/i3 or Pentium® processor in an LGA1155 socket.

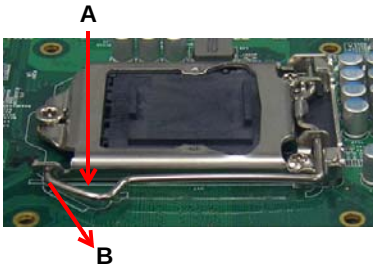
WARNING:

Disconnect all power to the board before installing a CPU to prevent damaging the board and CPU.

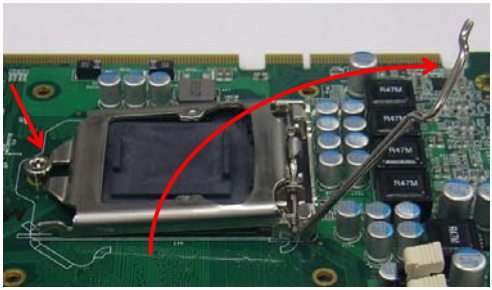
Do not touch socket contacts. Damaging the contacts voids the product warranty. Follow the installation instructions carefully to avoid damaging the board components.

To install the CPU:

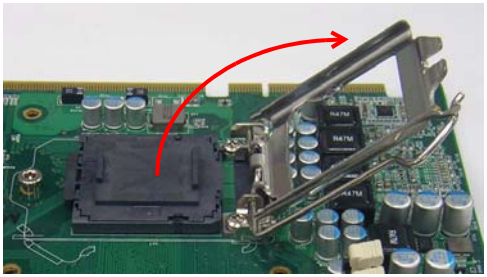
1. Press down on the locking arm (A), then push it away from the socket to disengage it from the retention tab (B).



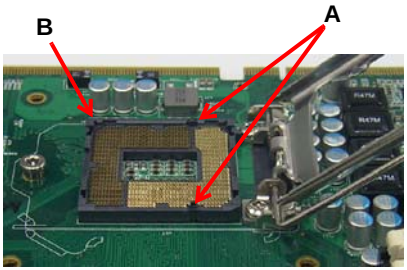
2. Raise the locking arm to unlock the load plate.



3. Lift the load plate to uncover the socket.



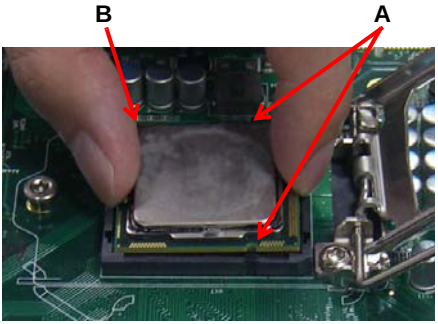
4. Remove the plastic protective cover from the socket. Note the locations of the alignment keys (A) and Pin 1 indicator (B).



WARNING:

Do NOT touch socket contacts.

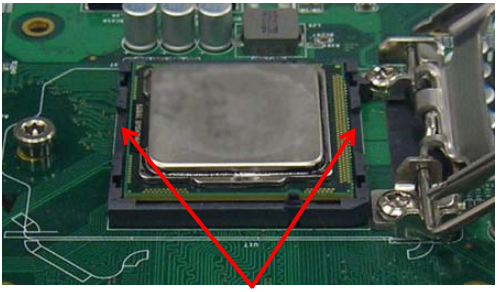
5. Hold the CPU using thumb and forefinger as shown. Position the CPU over the socket, matching the notches on the sides of the CPU with the alignment keys on the socket (A). The golden triangle on the CPU must be positioned at the corner of the socket with the Pin 1 indicator as shown (B).



WARNING:

The CPU fits into the socket in only one orientation. DO NOT force it into the socket to avoid causing damage.

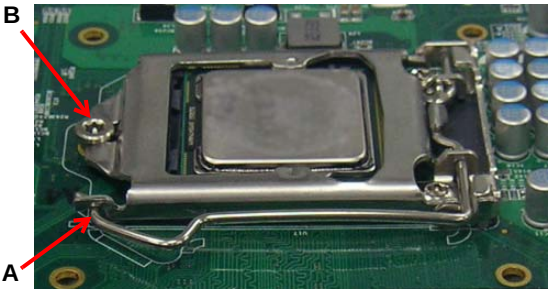
6. Carefully place the CPU into the socket vertically. The socket has cutouts for your fingers to fit into.



Cutouts

7. Gently lower the load plate. Make sure the front edge of the plate is under the screw as indicated.

8. Lower the locking arm and fasten it to the retention tab (A). The load plate should be locked underneath the screw as shown (B).



3.2 Installing the CPU Fan and Heatsink

The CPU requires a chassis with an airflow inlet and maximum internal ambient temperature of 60° C. A specially-designed CPU fan and heatsink must be installed before using the motherboard. Failure to install a CPU fan and heatsink may damage the system host board and/or the CPU.

When the CPU fan installation procedures presented here are inconsistent with the installation procedures you obtained from the CPU fan and heatsink package, follow the latter.

To install the CPU fan:

1. Apply thermal grease evenly on top of the installed CPU.
2. Lower the CPU fan to the CPU, then secure it using the provided attachments or screws.
3. Connect the CPU fan cable to the CPU fan connector on the motherboard labeled FAN1 (see “Onboard Connectors & Jumpers” on page 19).

3.3 Installing Memory Modules

The IMB-M40H supports up to 16 GB of DDR3 1066/1333 MHz (2nd Gen Intel® Core™) or 1333/1600 MHz (3rd Gen Intel® Core™) memory modules in two DIMM sockets. A DDR3 module has a 240-pin footprint compared to the legacy 184-pin DDR DIMM. DDR3 modules are notched to facilitate correct installation in the DIMM sockets and prevent installation of DDR2 or DDR modules.

Disconnect all power to the board before installing a memory module to prevent damaging the board and memory module.

Memory Configuration Options

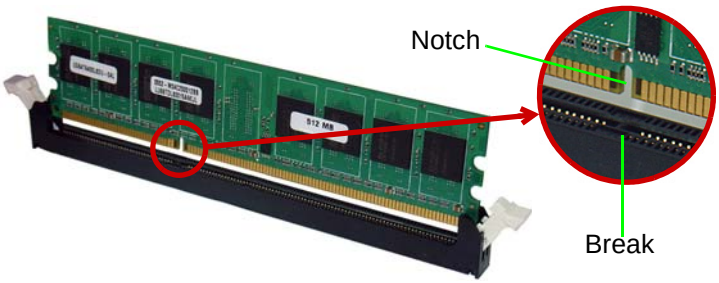
The IMB-M40H supports 1GB, 2GB, 4GB and 8GB unbuffered non-ECC DDR3 DIMMs in the following configurations:

- Channel A: DIMM_A1
  Channel B: DIMM_B1
- For dual-channel configuration, the total size of memory module installed per channel must be the same (DIMM_A1 = DIMM_B1).
- It is recommended that you install DIMMs with the same CAS latency. For maximum compatibility, install memory modules with the same brand, model, and/or rating.

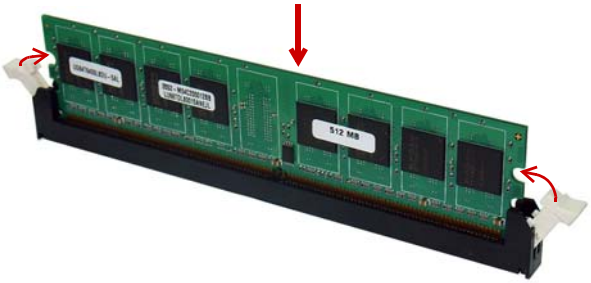
To install a memory module:

1. Locate the DIMM sockets on the motherboard.
2. Press the socket's retaining clips outward to unlock.

3. Align the memory module on the socket making sure that the notch matches the break on the socket.



4. Insert the module firmly into the slot until the retaining clips snap back inwards and the module is securely seated.



4 Driver Installation

This chapter provides information on how to install the IMB-M40H device drivers under Windows XP. The device drivers are located in the following ADLINK All-in-One CD directories:

Chipset	X:\CHIP
Display	X:\VGA
Ethernet	X:\LAN
Audio	X:\AUDIO
.NET	X:\OTHERS

Follow the instructions below to install the required IMB-M40H drivers:

1. Install the Windows operating system before installing any driver. Most standard I/O device drivers are installed during Windows installation.
2. Install the **Microsoft .NET Framework** by running the program **dotnetfx35.exe** in **X:\OTHERS\Microsoft .NET Framework 3.5.zip**. Follow the instructions given and reboot when instructed.
3. Install the **Chipset driver** by running the program **infinst_autol.exe** in **X:\CHIP\Chipset driver_intel_INF _Update_Utility_All_WinOS.zip**. Follow the instructions given and reboot when instructed.
4. Install the **Display driver** and utilities by running the program **Setup.exe** in **X:\VGA\IvyBridge\VGA_driver_ intel_Integrated_Graphic_Windows XP_32bit.zip**. Follow the instructions given and reboot when instructed.
5. Install the **Ethernet driver** by running the program **setup.exe** in **X:\LAN\Network_driver_Realtek_Network _Adapter for window XP 32-bit.zip**. Follow the instructions given and reboot if required.
6. Install the **Audio driver** by running the program **WDM_R270.exe** in **X:\AUDIO\Audio_driver_Realtek_Windows XP.zip**. Follow the instructions given and reboot if required.

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Important Safety Instructions

For user safety, please read and follow all **instructions**, **WARNINGS**, **CAUTIONS,** and **NOTES** marked in this manual and on the associated equipment before handling/operating the equipment.

- Read these safety instructions carefully.
- Keep this user's manual for future reference.
- Read the specifications section of this manual for detailed information on the operating environment of this equipment.
- When installing/mounting or uninstalling/removing equipment:
  - Turn off power and unplug any power cords/cables.
- To avoid electrical shock and/or damage to equipment:
  - Keep equipment away from water or liquid sources;
  - Keep equipment away from high heat or high humidity;
  - Keep equipment properly ventilated (do not block or cover ventilation openings);
  - Make sure to use recommended voltage and power source settings;
  - Always install and operate equipment near an easily accessible electrical socket-outlet;
  - Secure the power cord (do not place any object on/over the power cord);
  - Only install/attach and operate equipment on stable surfaces and/or recommended mountings; and,
  - If the equipment will not be used for long periods of time, turn off and unplug the equipment from its power source.

- Never attempt to fix the equipment. Equipment should only be serviced by qualified personnel.

A Lithium-type battery may be provided for uninterrupted, backup or emergency power.

Risk of explosion if battery is replaced with one of an incorrect type. Dispose of used batteries appropriately.

- Equipment must be serviced by authorized technicians when:
  - The power cord or plug is damaged;
  - Liquid has penetrated the equipment;
  - It has been exposed to high humidity/moisture;
  - It is not functioning or does not function according to the user's manual;
  - It has been dropped and/or damaged; and/or,
  - It has an obvious sign of breakage.

Getting Service

Contact us should you require any service or assistance.

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