PQ7-M100G Series

User's Manual

Version 1.0

Table of Contents

How to Use This Manual

The manual describes how to configure your PQ7-M100G series to meet various operating requirements. It is divided into five chapters, with each chapter addressing a basic concept and operation of this QSEVEN Module.

Chapter 1 : System Overview. Presents what you have in the box and give you an overview of the product specifications and basic system architecture for this model of single board computer.

Chapter 2 : Hardware Configuration. Describes the definition and location for Jumpers that you can easily configure your system.

Chapter 3 : System Installation. Describes how to properly mount the CPU, main memory to get a safe installation and provides a programming guide of Watch Dog Timer function.

Chapter 4 : BIOS Setup Information. Specifies the meaning of each setup parameters, how to get advanced BIOS performance and update new BIOS. In addition, POST checkpoint list will give users some guidelines of trouble-shooting.

The content of this manual and EC declaration document is subject to change without prior notice. These changes will be incorporated in new editions of the document. **Portwell** may make supplement or change in the products described in this document at any time.

Updates to this manual, technical clarification, and answers to frequently asked questions will be shown on the following web site : http://www.portwell.com.tw

Chapter 1 System Overview

1.1 Introduction

QSEVEN, a new industrial computer platform in "Module board" and "Carrier board" architecture, equipped processor or its socket, chipset, memory or memory socket and single Ethernet controller on it. The On-The-Shelf Module board allows users to create their own Carrier board easily and quickly since most critical parts are ready on Module board. QSEVEN Module board offers expansion interfaces such as PCI Express, SATA, LPC, LVDS, USB, SDVO and Audio etc. that could support variety functions depending on Carrier board design.

The Carrier board was customized design to fit in different mechanical requirements. In the meanwhile, its variety functions were also customized to meet the application. Compares to the platform that designed from nothing, QSEVEN architecture platform only needs to develop Carrier board. Users could keep their know-how which related to their core competence in the Carrier board.

PQ7-M100G series equipped Intel eMenlow chipset with Atom Z510/Z530 processor on-board), 512 MB DDR2 memories on-board, one Gigabit Ethernet controller on it to provide expansion interfaces – PCI Express x1 (supports four devices).

1.2 Check List

The PQ7-M100G series package should cover the following basic items

- ✓ One PQ7-M100G series module board
- ✓ Two Hex screws
- ✓ Two
- ✓ One Installation Resources CD (Driver and Manual)

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

1.3 Product Specification

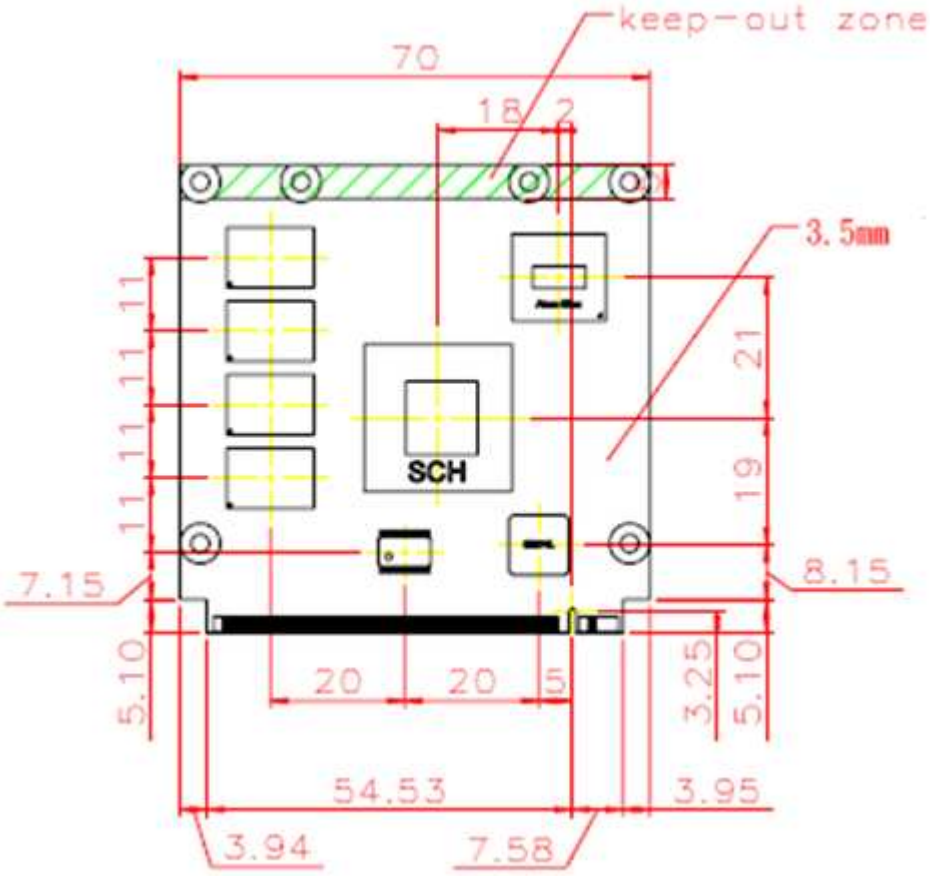
- **Main processor**
  - Intel® Atom Processor
  - FSB: Z510 400MHz; Z530 533MHz
- **Main Memory**
  Onboard DDR2 400/533 up to 512MB
- **L2 Cache Memory**
  Build-in processor
- **Chipset**
  Intel eMenlow (US15W) chipset
- **Expansion Interfaces**

  - PCI Express
    - One PCI Express x1 link (One optional link for Ethernet controller)
  - LVDS
    - Supports maximum 112MHz single channel LVDS interface
    - Single channel LVDS interface support: 24 bpp
    - Maximum Panel resolution supported up to 1366 x 768
  - SDVO (Serial Digital Video Output)
    - One SDVO port is supported
  - Ethernet
    - Intel 82574L Gigabit Ethernet controller is equipped

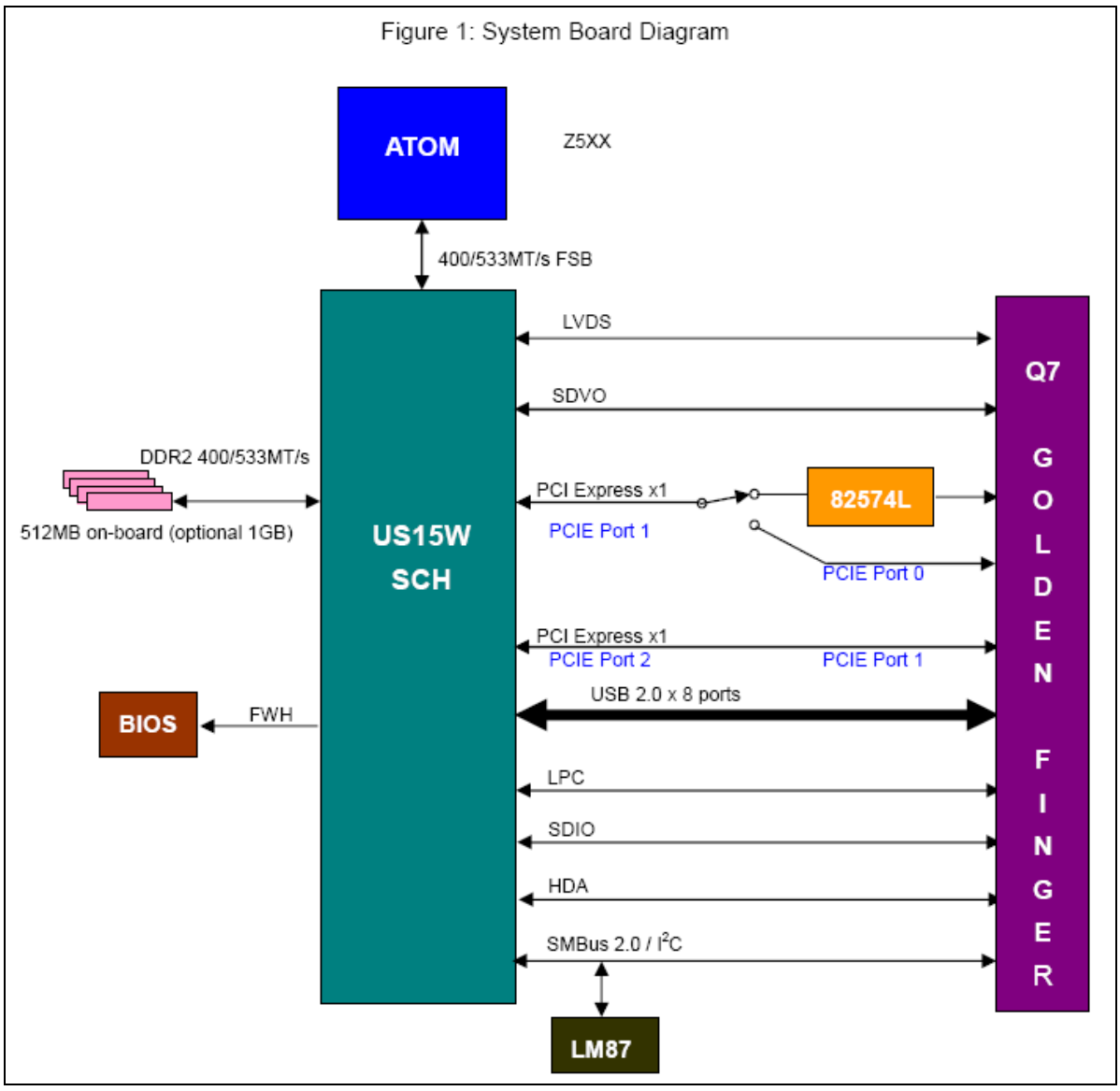
- USB Interface
  - Support eight USB 2.0 ports

- **Outline Dimension (L X W):**
  70mm x 70mm
- **Operating Temperature:**
  0°C ~ 60°C (32°F ~ 140°F)
- **Storage Temperature:**
  -20°C ~ 80°C
- **Relative Humidity:**
  5% ~ 90%, non-condensing

1.4 Mechanical Drawing



1.5 System Architecture



PQ7-M100G Series System Block Diagram

Chapter 2 Hardware Configuration

This chapter gives the definitions and shows the positions of jumpers, headers and connector. All of the configuration jumpers on Portwell EVB Carrier PQ7-C200 are in the proper position. The default settings shipped from factory are marked **Default**.

2.1 Jumper Setting

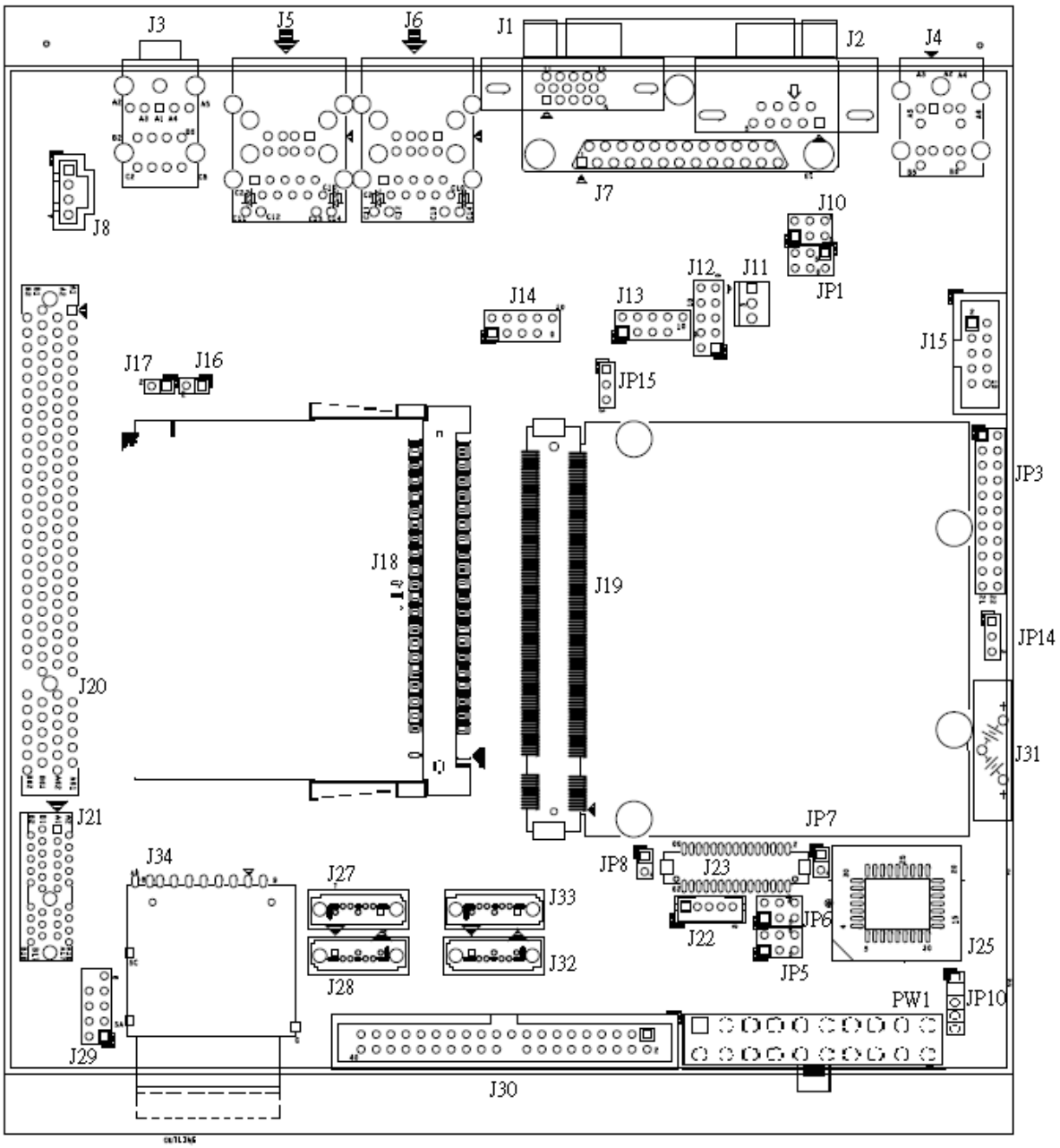


Figure 2-1 PQ7-C200 Jumper & Connector Location

Connector Function List

JP1		RS232 / IrDA Selection
	Function	**JP1**
Default	COM port	1-3 Short,2-4 Short
	IrDA	3-5 Short,4-6 Short

JP3		COM1(J2) Interface Selection
	Function	**JP3**
Default	RS-232	5-6,9-11,10-12,15-17,16-18 Short
	RS-422	3-4,7-9,8-10,13-15,14-16,21-22 Short
	RS-485	1-2,7-9,8-10,19-20 Short

JP5		LVDS Power Level
	Function	**JP5**
Default	3.3V	1-3 Short
	5V	3-5 Short
	12V	3-4 Short

JP6		LVDS Back-light Power Level
	Function	**JP6**
Default	5V – Active High	1-3 Short, 2-4 Short
	12V – Active High	1-3 Short, 4-6 Short
	5V – Active Low	3-5 Short, 2-4 Short
	12V – Active Low	3-5 Short, 4-6 Short

JP7		Auto Power Button Selection
	Function	**JP7**
Default	Disable	Open
	Enable	Short

JP8		BIOS Disable Selection
	Function	JP8
	Disable	Open
Default	Enable	Short

JP14		CMOS Clear
	Function	JP14
Default	Normal Operation	1-2 Short
	Clear CMOS Contents	2-3 Short

JP15		USB Client Selection (JP15)
	Function	JP15
Default	Enable USB Client	1-2 Short
	Disable USB Client	2-3 Short

2.2 Connector Allocation

Connector Function List

Connector	Description
J1	On-board VGA CRT Connector
J2	COM1 Serial Port1 Connector
J3	Audio Jack
J4	PS/ 2 Keyboard/ Mouse Connector
J5	Primary USBx2 + LAN Connector
J6	Secondary USBx2 + LAN Connector
J7	Parallel Port Header
J8	Audio CD-in Connector
J10	IrDA Connector
J11	3-pin Fan Header
J12	General Purpose I/O Header
J13	3rd pairs of USB Header
J14	4th pairs of USB Header
J15	COM2 Serial Port2 Header
J16	External LAN1 port Link/Act LED
J17	External LAN2 port Link/Act LED
J18	Mini-PCI Connector
J19	MXM Connector
J20	PCI Connector
J21	PCI-Express x1 Connector
J22	LVDS Panel Back-light Power Connector
J23	LVDS Panel Connector
J25	Firmware hub socket
J27	SATA1 Connector
J28	SATA2 Connector
J29	Front panel Connector
J30	IDE Connector
J31	Battery Connector
J32	SATA4 Connector
J33	SATA3 Connector
J34	SD Connector

Pin Assignments of Connectors

J1: On-board VGA CRT Connector

PIN No.	Signal Description
1	Red
2	Green
3	Blue
4	Monitor ID0 (MONID0) (5V I/F)
5	Ground
6	Ground
7	Ground
8	Ground
9	+5V
10	Ground
11	Monitor ID1 (MONID1) (5V I/F)
12	VGA DDC Data (5V I/F)
13	Horizontal Sync. (HSYNC) (5V I/F)
14	Vertical Sync. (VSYNC) (5V I/F)
15	VGA DDC Clock (5V I/F)

J2 : COM1 Serial Port Connector

PIN No.	Signal Description		
	RS-232	RS-422	RS-485
1	DCD (Data Carrier Detect)	TX-	DATA-
2	RXD (Receive Data)	TX+	DATA+
3	TXD (Transmit Data)	RX+	N/C
4	DTR (Data Terminal Ready)	RX-	N/C
5	GND (Ground)	GND	GND
6	DSR (Data Set Ready)	N/C	N/C
7	RTS (Request to Send)	N/C	N/C
8	CTS (Clear to Send)	N/C	N/C
9	RI/5V/12V	N/C	N/C

J3 : Audio Jack

J4 : PS/ 2 Keyboard/ Mouse Connector

PIN No.	Signal Description
B1	Mouse Data
A1	Keyboard Data
A3,B3	Ground
A4,B4	5V Dual
A2,A6,B2,B6	N/C
B5	Mouse Clock
A5	Keyboard Clock

J5: Prinary USBx2 + LAN Connector

PIN No.	Signal Description	PIN No.	Signal Description (Top Con.)
1	MDI0+ (MDI0P)	1	5V Dual
2	MDI0- (MDI0N)	2	USB1-
3	MDI1+ (MDI1P)	3	USB1+
4	MDI2+ (MDI2P)	4	Ground
5	MDI2- (MDI2N)	5	5V Dual
6	MDI1- (MDI1N)	6	USB0-
7	MDI3+ (MDI3P)	7	USB0+
8	MDI3- (MDI3N)	8	Ground

J6: Second USBx2 + LAN Connector

PIN No.	Signal Description	PIN No.	Signal Description (Top Con.)
1	MDI0+ (MDI0P)	1	5V Dual
2	MDI0- (MDI0N)	2	USB1-
3	MDI1+ (MDI1P)	3	USB1+
4	MDI2+ (MDI2P)	4	Ground
5	MDI2- (MDI2N)	5	5V Dual
6	MDI1- (MDI1N)	6	USB0-
7	MDI3+ (MDI3P)	7	USB0+
8	MDI3- (MDI3N)	8	Ground

J7: Parallel Port Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	Strobe#	14	Auto Form Feed#
2	Data 0	15	Error#
3	Data 1	16	Intialization#
4	Data 2	17	Printer Select IN#
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	25	Ground
13	Printer Select		

J10: IrDA Connector

PIN No.	Signal Description
1	IRRX
2	Ground
3	Ground
4	NC
5	IRTX
6	VCC

J11 : 3-pin Fan Connector

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

J12: General Purpose I/O Connector

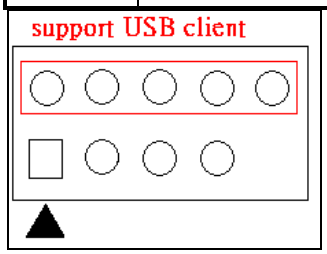
PIN No.	Signal Description	PIN No.	Signal Description
1	General Purpose I/O Port 0 (GPIO0)	2	General Purpose I/O Port 4 (GPIO4)
3	General Purpose I/O Port 1 (GPIO1)	4	General Purpose I/O Port 5 (GPIO5)
5	General Purpose I/O Port 2 (GPIO2)	6	General Purpose I/O Port 6 (GPIO6)
7	General Purpose I/O Port 3 (GPIO3)	8	General Purpose I/O Port 7 (GPIO7)
9	Ground	10	+5V

J13: 3rd pairs of USB Header

PIN No.	Signal Description	PIN No.	Signal Description
1	5V Dual	2	5V Dual
3	USB-	4	USB-
5	USB+	6	USB+
7	Ground	8	Ground
9		10	N/C

J14: 4th pairs of USB Header

PIN No.	Signal Description	PIN No.	Signal Description
1	5V Dual	2	5V Dual
3	USB-	4	USB- (Support USB Client)
5	USB+	6	USB+ (Support USB Client)
7	Ground	8	Ground
9		10	N/C



J15 : COM2 Serial Port BOX Header

PIN No.	Signal Description
	RS-232
1	DCD (Data Carrier Detect)
2	RXD (Receive Data)
3	TXD (Transmit Data)
4	DTR (Data Terminal Ready)
5	GND (Ground)
6	DSR (Data Set Ready)
7	RTS (Request to Send)
8	CTS (Clear to Send)
9	RI/5V/12V
10	N/C

J16 : External LAN1 port Link/Act LED

PIN No.	Signal Description
1	L1_ACT#
2	L1_LINKLED#

J17 : External LAN2 port Link/Act LED

PIN No.	Signal Description
1	L2_ACT#
2	L2_LINKLED#

J18: Mini-PCI Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	N/C	2	N/C
3	N/C	4	N/C
5	N/C	6	N/C
7	N/C	8	N/C
9	N/C	10	N/C
11	N/C	12	N/C
13	N/C	14	N/C
15	N/C	16	N/C
17	INTA-	18	VCC
19	VCC3	20	INTB-
21	N/C	22	N/C
23	GND	24	3.3VAUX
25	S_PCLK1	26	S_RST-
27	GND	28	VCC3
29	S_REQ-1	30	S_GNT-1
31	VCC3	32	GND
33	SAD31	34	PME#
35	SAD29	36	N/C
37	GND	38	SAD30
39	SAD27	40	VCC3
41	SAD25	42	SAD28
43	N/C	44	SAD26
45	SCBE-3	46	SAD24
47	SAD23	48	IDSEL
49	GND	50	GND
51	SAD21	52	SAD22
53	SAD19	54	SAD20
55	GND	56	S_PAR
57	SAD17	58	SAD18
59	SCBE-2	60	SAD16
61	S_IRDY-	62	GND
63	VCC3	64	S_FRAME-
65	N/C	66	S_TRDT-
67	S_SERR-	68	S_STOP-
69	GND	70	VCC3
71	S_PERR-	72	S_DEVSEL-
73	SCBE-1	74	GND
75	SAD14	76	SAD15

77	GND	78	SAD13
79	SAD12	80	SAD11
81	SAD10	82	GND
83	GND	84	SAD9
85	SAD8	86	SCBE-0
87	SAD7	88	VCC3
89	VCC3	90	SAD6
91	SAD5	92	SAD4
93	N/C	94	SAD2
95	SAD31	96	SAD0
97	VCC	98	N/C
99	SAD1	100	N/C
101	GND	102	KEY
103	N/C	104	ME66EN
105	N/C	106	N/C
107	N/C	108	N/C
109	N/C	110	N/C
111	N/C	112	N/C
113	N/C	114	GND
115	N/C	116	N/C
117	N/C	118	N/C
119	N/C	120	N/C
121	N/C	122	N/C
123	N/C	124	N/C

J19: MXM Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	GND	2	GND
3	N/C	4	N/C
5	N/C	6	N/C
7	N/C	8	N/C
9	N/C	10	N/C
11	N/C	12	N/C
13	N/C	14	N/C
15	N/C	16	SLP_S5#
17	WAKE#	18	SLP_S3#
19	VSB3	20	PWRBTN#_PM
21	N/C	22	N/C
23	GND	24	GND
25	GND	26	PWROK_Q7
27	VSB3	28	RST_SYS#
29	N/C	30	N/C
31	N/C	32	N/C
33	VCC	34	GND
35	N/C	36	N/C
37	N/C	38	N/C
39	GND	40	GND
41	BIOS_DISABLE#	42	SLOT2_CLK
43	SLOT2_CD#	44	SD2_LED
45	SLOT2_CMD	46	SLOT2_WP
47	SD2PWR#	48	SLOT2_DATA1
49	SLOT2_DATA0	50	SLOT2_DATA3
51	SLOT2_DATA2	52	N/C
53	N/C	54	N/C
55	N/C	56	N/C
57	GND	58	GND
59	HDA_SYNC	60	SMB_CLK
61	HDA_RST#	62	SMB_DATA
63	HDA_BITCLK	64	N/C
65	HDA_SDATAIN0	66	I2C_CLK
67	HDA_SDATAOUT	68	I2C_DAT
69	PM_THRM#	70	WDTO
71	GND	72	N/C
73	DF_USB_PN7	74	GND
75	DF_USB_PN7	76	DF_USB_PN6

77	DF_USB_PP7	78	DF_USB_PP6
79	USB_6_7_OC#	80	USB_4_5_OC#
81	DF_USB_PN5	82	DF_USB_PN4
83	DF_USB_PP5	84	DF_USB_PP4
85	USB_2_3_OC	86	USB_0_1_OC#
87	DF_USB_PN3	88	DF_USB_PN2
89	DF_USB_PP3	90	DF_USB_PP2
91	N/C	92	N/C
93	DF_USB_PN1	94	DF_USB_PN0
95	DF_USB_PP1	96	DF_USB_PP0
97	GND	98	GND
99	LA_DATAP0	100	LB_DATAP0
101	LA_DATAN0	102	LB_DATAN0
103	LA_DATAP1	104	LB_DATAP1
105	LA_DATAN1	106	LB_DATAN1
107	LA_DATAP2	108	LB_DATAP2
109	LA_DATAN2	110	LB_DATAN2
111	L_VDDEN	112	L_BKLTEN
113	LA_DATAP3	114	LB_DATAP3
115	LA_DATAN3	116	LB_DATAN3
117	GND	118	GND
119	DF_LA_CLKP	120	DF_LB_CLKP
121	DF_LA_CLKN	122	DF_LB_CLKN
123	L_BKLTCTL	124	N/C
125	N/C	126	LVDS_BLC_DAT
127	N/C	128	LVDS_BLC_CLK
129	N/C	130	N/C
131	SDVO_CLK	132	N/C
133	SDVO_CLK#	134	N/C
135	GND	136	GND
137	SDVO_GREEN	138	N/C
139	SDVO_GREEN#	140	N/C
141	GND	142	GND
143	SDVO_BLUE	144	SDVO_TVCLKIN
145	SDVO_BLUE#	146	SDVO_TVCLKIN#
147	GND	148	N/C
149	SDVO_RED	150	SDVO_CTRLDATA
151	SDVO_RED#	152	SDVO_CTRLCLK
153	N/C	154	N/C
155	DF_CLK_PCIE+	156	PCIE_WAKE#

157	DF_CLK_PCIE-	158	RST#
159	GND	160	GND
161	N/C	162	N/C
163	N/C	164	N/C
165	GND	166	GND
167	N/C	168	N/C
169	N/C	170	N/C
171	N/C	172	EXCD1_PERST#
173	DF_PCIE_TX2+	174	PCIE_RX2+
175	DF_PCIE_TX2-	176	PCIE_RX2-
177	N/C	178	N/C
179	DF_PCIE_TXP1	180	PCIE_RXP1
181	DF_PCIE_TXN1	182	PCIE_RXN1
183	GND	184	GND
185	LPC_AD0	186	LPC_AD1
187	LPC_AD2	188	LPC_AD3
189	CLK_LPC_FWH	190	LPC_FRAME#
191	LPC_SERIRQ	192	LPC_LDRQ#
193	V3.3A_RTC	194	SPKR
195	N/C	196	N/C
197	GND	198	GND
199	N/C	200	N/C
210	N/C	202	N/C
203	N/C	204	H_A20M#
205	VSB5	206	VSB5
207	N/C	208	N/C
209	N/C	210	N/C
211	VCC	212	VCC
213	VCC	214	VCC
215	VCC	216	VCC
217	VCC	218	VCC
219	VCC	220	VCC
221	VCC	222	VCC
223	VCC	224	VCC
225	VCC	226	VCC
227	VCC	228	VCC
229	VCC	230	VCC

J20: PCI Connector

PIN No.	Signal Description	PIN No.	Signal Description
A01	TRST# (Pull-Low)	B01	-12V
A02	12 V	B02	4.7K Pull-Low
A03	PTMS (2.7K Pull-high 5V)	B03	GND
A04	PTDI (2.7K Pull-high 5V)	B04	N/C
A05	VCC	B05	VCC
A06	PIRQ#B	B06	VCC
A07	PIRQ#F	B07	PIRQ#D
A08	VCC	B08	PIRQ#G
A09	N/C	B09	N/C
A10	VCC	B10	N/C
A11	N/C	B11	N/C
A12	GND	B12	GND
A13	GND	B13	GND
A14	N/C	B14	NC
A15	PCIRST#	B15	GND
A16	VCC	B16	PCI Clock
A17	PGNT#0	B17	GND
A18	GND	B18	PREQ#0
A19	PME#	B19	VCC
A20	AD30	B20	AD31
A21	VCC3	B21	AD29
A22	AD28	B22	GND
A23	AD26	B23	AD27
A24	GND	B24	AD25
A25	AD24	B25	VCC3
A26	IDSEL (AD20)	B26	C/BE#3
A27	VCC3	B27	AD23
A28	AD22	B28	GND
A29	AD20	B29	AD21
A30	GND	B30	AD19
A31	AD18	B31	VCC3
A32	AD16	B32	AD17
A33	VCC3	B33	C/BE#2
A34	FRAME#	B34	GND
A35	Ground	B35	IRDY#
A36	TRDY#	B36	VCC3
A37	GND	B37	DEVSEL#
A38	STOP#	B38	GND

A39	VCC3	B39	LOCK#
A40	N/C	B40	PERR#
A41	N/C	B41	VCC3
A42	GND	B42	SERR#
A43	PAR	B43	VCC3
A44	AD15	B44	C/BE#1
A45	VCC3	B45	AD14
A46	AD13	B46	Ground
A47	AD11	B47	AD12
A48	GND	B48	AD10
A49	AD9	B49	GND
A50	KEY	B50	KEY
A51	KEY	B51	KEY
A52	C/BE#0	B52	AD8
A53	VCC3	B53	AD7
A54	AD6	B54	VCC3
A55	AD4	B55	AD5
A56	Ground	B56	AD3
A57	AD2	B57	GND
A58	AD0	B58	AD1
A59	VCC	B59	VCC
A60	4.7K Pull-High VCC	B60	4.7K Pull-High VCC
A61	VCC	B61	VCC
A62	VCC	B62	VCC

J21: PCI-Express x1 Connector

PIN No.	Signal Description	PIN No.	Signal Description
A01	NC	B01	Ground
A02	NC	B02	DF_CLK_PCIE2
A03	Ground	B03	DF_CLK_PCIE#2
A04	NC	B04	Ground
A05	NC	B05	NC
A06	Ground	B06	NC
A07	NC	B07	Ground
A08	NC	B08	NC
A09	Ground	B09	NC
A10	NC	B10	NC
A11	NC	B11	PCIE_WAKE#
A12	RST#	B12	Ground
A13	Ground	B13	NC
A14	NC	B14	NC
A15	NC	B15	Ground
A16	Ground	B16	DF_PCIE_TXP2
A17	DF_PCIE_RXP2	B17	DF_PCIE_TXN2
A18	DF_PCIE_RXN2	B18	Ground

J22: LVDS Panel Back-light Power Connector

PIN No.	Signal Description
1	Backlight Enable (select by JP6)
2	Ground
3	+12V
4	LVDS_PMW
5	+5V

J23: LVDS Panel Caonnector

PIN No.	Signal Description	PIN No.	Signal Description
1	LA_DATAP0	2	LA_DATAN0
3	LA_DATAP1	4	LA_DATAN1
5	LA_DATAP2	6	LA_DATAN2
7	LA_DATAP3	8	LA_DATAN3
9	DF_LA_CLKP	10	DF_LA_CLKN
11	LB_DATAP0	12	LB_DATAN0
13	LB_DATAP1	14	LB_DATAN1
15	LB_DATAP2	16	LB_DATAN2
17	LB_DATAP3	18	LB_DATAN3
19	DF_LB_CLKP	20	DF_LB_CLKN
21	LVDS_BLC_DAT	22	LVDS_BLC_CLK
23	Ground	24	L_BKLTCTL
25	Ground	26	Ground
27	VDD_LVDS	28	VDD_LVDS
29	N/C	30	VDD_LVDS

J25: Firmware hub socket

J27,J28: FIRST Primary/Secondary SATA Connector

PIN No.	Signal Description
1	Ground
2	SATATX+
3	SATATX-
4	Ground
5	SATARX-
6	SATARX+
7	Ground

J29 : Front panel Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	HD_LED_P	2	FP PWR/SL_P
3	HD_LED_N	4	FP PWR/SL_N
5	RST_SW_N	6	PWR_SW_P
7	RST_SW_P	8	PWR_SW_N
9	RSVD_DNU	10	

J30 : IDE Connector

PIN No.	Signal Description	PIN No.	Signal 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	DMA REQ	22	Ground
23	IOW#	24	Ground
25	IOR#	26	Ground
27	IOCHRDY	28	Pull-down
29	DMA ACK#	30	Ground
31	INT REQ	32	N/C
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD Active#	40	Ground

J31 : Battery Connector

PIN No.	Signal Description
1	3V Battery In
2	3V Battery In
3	Ground

J32,J33: SECOND Primary/Secondary SATA Connector

PIN No.	Signal Description
1	Ground
2	SATATX+
3	SATATX-
4	Ground
5	SATARX-
6	SATARX+
7	Ground

J34 : SD Connector

Chapter 3 System Installation

This chapter provides you with instructions to set up your system. The additional information is enclosed to help you set up onboard PCI device and handle Watch Dog Timer (WDT) and operation of GPIO in software programming.

3.1 Intel ATOM processor Z510/Z530 CPU

Configuring System Bus
PQ7-M100G will automatically detect the CPU FSB 400/533MHz CMOS used.
CPU speed of Intel ATOM Processor for Mobile can be detected automatically.

3.2 Intel System Controller Hub US15W

The Intel® System Controller Hub US15W is a low-power chipset in one small 22x22mm package, It combines the Intel® Graphics Media Accelerator 500,memorycontroller, and I/O controller in a single-chip solution while featuring advanced 3D graphics and extensive I/O capabilities such as USB2.0,SDIO and PCI Express. It supports Intel® High Definition Audio and hardware video decode acceleration, a 400/533 MHz CMOS front-side bus, dual independent display.

3.3 Main Memory

PQ7-M100G provide 512 MBytes of on-board DDR2-SDRAM as main memory. Memory clock and related settings can be detected by BIOS via SPD interface.

Memory frequency / CPU FSB synchronization

PQ7-M100G supports different memory frequencies depending on the CPU front side bus and the type of DDR2-SDRAM.

CPU FSB	Memory Frequency
533MHz	533MHz
400MHz	400MHz

3.4 Installing the Single Board Computer

To install your PQ7-M100G into standard chassis or proprietary environment, please perform the following:

Step 1 : Check all jumpers setting on proper position
Step 2 : Install and configure CPU and memory module on right position
Step 3 : Place PQ7-M100G into the dedicated position in the system
Step 4 : Attach cables to existing peripheral devices and secure it

WARNING

Please ensure that SBC is properly inserted and fixed by mechanism.

Note:
Please refer to section 3.4.1 to 3.4.4 to install V-RAID/INF/VGA/LAN/Audio drivers.

3.4.1 VIA V-RAID Driver Disk Preparation Utility

The VIA VT6421A chipset Controller **Dual Channel SATA devices (J27/ J28)**& **Single Channel Ultra ATA (J30)**.

Please find VIA V-RAID driver form PQ7-M100G CD-title. When you run up this Driver Disk Preparation Utility, it will prompt you to select one or more Operation Systems and your target drive to create a driver disk.

Set BIOS to Boot from VIA V-RAID SATA/IDE devices (J27/ J28)& (J30):

※1. Start your computer with the CD in the CD/DVD Device.

2. **Reboot the system and press <Del> during the Power-On Self-Test (POST) to enter the BIOS Setup Utility.**
3. **Go to the Advanced BIOS Features > First Boot Device > CD/DVD Device Mode item in the BIOS.**
4. **Save your changes and Exit Setup.**

To install the VIA V-RAID driver:

1. **During the OS installation, the system prompts to press the <F6> key to install VIA V-RAID driver.**
2. **Press <F6> then insert the floppy disk with RAID driver into the floppy disk drive.**
3. **Follow the succeeding screen instructions to complete the installation.**

3.4.2 Chipset Component Driver

The chipset on PQ7-M100G is a new chipset that a few old operating systems might not be able to recognize. To overcome this compatibility issue, for Windows Operating Systems such as Windows XP/VISTA, please install its INF before any of other Drivers are installed. You can find very easily this chipset component driver in PQ7-M100G CD-title.

3.4.3 Intel Integrated Graphics GMCH Chip

Using Intel® SCH US15W with Media Accelerator High performance graphic integrated chipset is aimed to gain an outstanding graphic performance. Shared 1MB to 8MB system DDR2-SDRAM Memory with Total Graphics Memory. This combination makes PQ7-M100G an excellent piece of multimedia hardware.

Drivers Support

Please find Springdale GMCH driver in the PQ7-M100G CD-title. Drivers support Windows XP / VISTA.

3.4.4 Intel Gigabit Ethernet Controller

Drivers Support

Please find Intel 82541PI LAN driver in /Ethernet directory of PQ7-M100G CD-title. The drivers support Windows XP / VISTA.

LED Indicator (for LAN status)

PQ7-M100G provides two LED indicators to report Intel 82541PI Gigabit Ethernet interface status. Please refer to the table below as a quick reference guide.

Intel 82541PI	Color	Name of LED	Operation of Ethernet Port		
			Linked	Active	
Status LED	Green	Linked & Active LED	On	Blinking	
Speed LED	Orange	speed LED	Giga Mbps	100 Mbps	10 Mbps
	Green		Orange	Green	Off

3.4.5 Audio Controller

Please find Realtek ALC262 Audio driver form PQ7-M100G CD-title. The drivers support Windows XP / VISTA.

3.5 Clear CMOS Operation

The following table indicates how to enable/disable Clear CMOS Function hardware circuit by putting jumpers at proper position.

JP14	Function	
2-3 Short	Clear CMOS contents	
1-2 Short	Normal Operation ★	

To correctly operate CMOS Clear function, users must turn off the system, move JP14 jumper to short pin 2 and 3.
Move the JP14 back to 1-2 position (Normal Operation) and start the system.
System will then produce a "CMOS Check Sum Error" message and hold up.
Users may then follow the displayed message to load BIOS default setting.

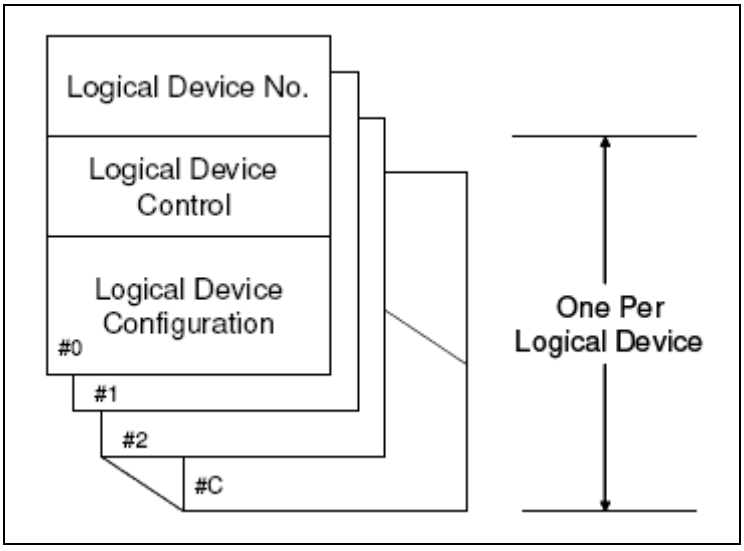
3.6 WDT Function

The algorithm of the WDT function can be simply described as a timer counting process with an output event. The Time-Out period (T_{wd}) can be set by software commands or hardware jumpers that depend on the board circuit design and may be different among the boards. This timer can be used to monitor a software hang.

PQ7-M100G allows users to control WDT by issuing dynamic software commands.The WDT starts counting when it is activated. It will cause a system reset once it expires. Before WDT expires, a refreshing command with a T_{wd} can be issued to re-count WDT and continue the status monitoring. If the system encounters a software or application hang, WDT will generate a system reset after its timeout.

The related Control Registers of WDT are included in the following programming guide that is written in C language. User can write a non-zero value (defined as T_{wd}) into the Time-out Value Register (CR_T_{wd}) to enable WDT. Users can write 0x00 and then T_{wd} to CR_T_{wd} to refresh WDT. To refresh WDT, the time tolerance of refreshing interval must be considered. The smaller of T_{wd}, the more deviation of WDT and you need to include more tolerance. “Let T_{wd} be longer than 2 seconds” is the recommendation due to the limitation of Winbond W83627DHG WDT. You can call Portwell support center for reference. The value read back from CR_T_{wd} indicates the counting down value instead of the original T_{wd}. System will be reset after the Time-out Value to be counted down to zero. Users can directly fill a zero value into CR_T_{wd} to disable WDT immediately. To ensure a successful access to the desired Control Register, the following programming guide should be followed.

Programming guide :
CR: Configuration Register.
LD: Logical Device of SIO. There are 12 LDs in W83627DHG SIO.
CR00~2F: Global Control Registers. (All LDs share these CRs)
CR07: LD selection.
CR30~FF: Each LD has its own CR30~FF.



There are two I/O ports as I/O access window for configuring WDT,
1) IO port 0x2E is H/W strapped and named as EFIR (Extended Function Index Register, for identifying CR index number)
2) IO port 0x2F is H/W strapped and named as EFDR (Extended Function Data Register, for accessing desired CR)

<< How to access W83627DHG Configuration Register >>
First, it needs to enter extended function mode.
Enter extended function mode for accessing W83627DHG configuration registers:
outportb (EFIR, 0x87);
outportb (EFIR, 0x87); // double IO write

Read Configuration Register CR_rx, and keep this byte to unsigned char al_char
outportb(EFIR, CR_rx) ;
al_char = inportb(EFDR) ;

Write Configuration Register CR_wx with byte al_char1 ;
outportb (EFIR, CR_wx) ;
outportb (EFDR, al_char1);
Exit extended mode after completion of configuration register access.
outportb(EFIR, 0xaa);

<< How to access W83627DHG WDT Configuration Register >>
Must enter extended function mode first, then follow the following steps for accessing WDT registers.

Step (1): CR2D_bit0P0
Initialize the multiplex pin (pin77) to WDTO function
outportb (EFIR , 0x2D) ; // al_char1 : unsigned char
al_char1 = inportb (EFDR) & 0xFE; // CR2D_bit0P0
outportb (EFIR , 0x2D) ; // init pin 77 to WDT
outportb (EFDR , al_char1) ;

Step (2) : CR07_P08
Ponit to LD8.
outportb (EFIR , 0x07) ;
outportb (EFDR , 0x08) ;

Step (3) : LD8_CR30_bit0P1
Activate LD8
outportb (EFIR , 0x30) ;
al_char1 = inportb (EFDR) | 0x01 ; // CR30_bit0P1
outportb (EFIR , 0x30) ; // Activate LD8
outportb (EFDR , al_char1) ;

Step (4) : LD8_CRF7_bit[7,6]P[0,0]
Not allow K/B and Mouse's interrupts to reload WDT timer.
outportb (EFIR , 0xF7) ;
al_char1 = inportb (EFDR) & 0x3F ; // CRF7_bit[7,6]P[0,0]
outportb (EFIR , 0xF7) ;
outportb (EFDR , al_char1) ;

Step (5) : Refresh WDT before it expires.
Once WDT expires, system will be reset.
LD8_CRF5_bit3 :
0 : Second Mode
1 : Minute Mode
LD8_CRF6: T_{wd} , "Writing 00" means "disable WDT"
1~255 time unit (time unit: second, minute)

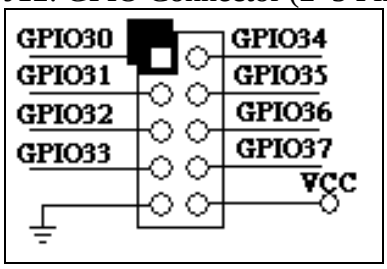
Notes:
"CR2D_bit0P0"means " Write 0 to bit0 of Configuration Register 0x2D".

3.7 GPIO

The PQ7-M100G provides 8 programmable input or output ports that can be individually configured to perform a simple basic I/O function. Users can configure each individual port to become an input or output port by programming register bit of I/O Selection. To invert port value, the setting of Inversion Register has to be made. Port values can be set to read or write through Data Register.

The GPIO ports are located on J12 shown as follows.
Notes : **Do not short-circuit Pin 9 and 10 of J12 !**

J12: GPIO Connector (2*5 Pin Header)



J12: General Purpose I/O Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	GPIO0	2	GPIO4
3	GPIO1	4	GPIO5
5	GPIO2	6	GPIO6
7	GPIO3	8	GPIO7
9	Ground	10	+5V

Programming Guide :
Must enter extended function mode (Double I/O write 0x87 to EFIR) first , then follow the following steps for accessing GPIO pins . When completion of GPIO access, Exit extended mode (I/O write 0xaa to EFIR).

(1) Initialize W83627DHG multiplex pins as GPIO30~37 pins
CR2C_bit[7:5]P[0,0,0]

```
outportb ( EFIR , 0x2C ) ;          // al_char1 : unsigned char
al_char1 = inportb ( EFDR ) | 0x02 ;  // CR2C_bit[7:5]P[0,0,0]
outportb ( EFIR , 0x2C ) ;          // init GP30~37 function
outportb ( EFDR , al_char1 ) ;
```

(2) Point to LD9 and activate its function

```
CR07_P09      ;   Point to LD9
outportb ( EFIR , 0x09 ) ;
```

```
outportb ( EFDR , 0x09 ) ;

LD9_CR30_bit1P1 ;  Activate LD9
outportb ( EFIR , 0x30 ) ;
al_char1 = inportb ( EFDR ) | 0x02 ;  // CR30_bit1P1
outportb ( EFIR , 0x30 ) ;          // Activate LD9
outportb ( EFDR , al_char1 ) ;

(3) LD9_CRF2_PFF  ;  Inverse input/output signals
outportb ( EFIR , 0xF2 ) ;
outportb ( EFDR , 0xFF ) ;

(4) LD9_CRF0_PF0       ;  Set GP30~33 as input pins and GP34~37 as output pins
outportb ( EFIR , 0xF0 )  ;
outportb ( EFDR , 0xF0 ) ;

(5) LD9_CRF1       ; Data Register for reading/writing data to GPIO pins
                   ; E.g. if put four jumper caps on J12 pin1-2,3-4,5-6,and 7-8
                   ; ( Warning : J22 pin9-10 is not allowed to be short circuit. )
                   ; and then Write [1,0,1,0] to bit[3:0] , you can get [1,0,1,0] from
                   ; bit[7:4].
```

Chapter 4 BIOS Setup Information

PQ7-M100G is equipped with the AWARD BIOS stored in Flash ROM. These BIOS has a built-in Setup program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS RAM so that it is retained during power-off periods. When system is turned on, PQ7-M100G communicates with peripheral devices and checks its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start-up.

4.1 Entering Setup

Turn on or reboot the computer. When the message "Hit <DEL> if you want to run SETUP" appears, press <Del> key immediately to enter BIOS setup program.

If the message disappears before you respond, but you still wish to enter Setup, please restart the system to try "COLD START" again by turning it OFF and then ON, or touch the "RESET" button. You may also restart from "WARM START" by pressing <Ctrl>, <Alt>, and <Delete> keys simultaneously. If you do not press the keys at the right time and the system will not boot, an error message will be displayed and you will again be asked to,

Press <F1> to Run SETUP or Resume

In HIFLEX BIOS setup, you can use the keyboard to choose among options or modify the system parameters to match the options with your system. The table below will show you all of keystroke functions in BIOS setup.

General Help	
↑ ↓→ ←	: Move
Enter	: Select
+ / - /PU /PD	: Value
ESC	: Exit
F1	: General Help
F2	: Item Help
F5	: Previous Values
F6	: Fail-Safe Defaults
F7	: Optimized Defaults
F9	: Menu in BIOS
F10	: Save

4.2 Main Menu

Once you enter PQ7-M100G AWARD BIOS CMOS Setup Utility, a Main Menu is presented. The Main Menu allows user to select from eleven setup functions and two exit choices. Use arrow keys to switch among items and press <Enter> key to accept or bring up the sub-menu.

Phoenix- AwardBIOS CMOS Setup Utility

▶ Standard CMOS Features ▶ Advanced BIOS Features ▶ Advanced Chipset Features ▶ Integrated Peripherals ▶ Power Management Setup ▶ PnP/PCI Configurations ▶ PC Health Status	Load Fail-Safe Defaults Load Optimized Defaults Set Supervisor Password Set User Password Save & Exit Setup Exit Without Saving
ESC : Quit F10 : Save & Exit Setup	↑ ↓ → ← : Select Item
Time, Date, Hard Disk Type …	

Note:
It is strongly recommended to reload Optimal Setting if CMOS is lost or BIOS is updated.

4.3 Standard CMOS Setup Menu

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

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

Phoenix- AwardBIOS CMOS Setup Utility
Standard CMOS Features

Date (mm:dd:yy)	Tue, Feb 19 2008	Item Help
Time (hh:mm:ss)	10 : 20 : 30	
▶ IDE Channel 0 Master	[None]	Menu Level ▶
▶ IDE Channel 0 Slave	[None]	Change the day, month, year and century
Video	[EGA/VGA]	
Halt On	[All , But Keyboard]	
Base Memory	639K	
Extended Memory	*514048K*	
Total Memory	*515072K*	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Note:
Oblique items are base on memory capacity which user adopts on single board.

■ **Menu Selections**

Item	Options	Description
Date	mm:dd:yy	Change the day, month, year and century
Time	hh:mm:ss	Change the internal clock
IDE Channel 0 Master	Options are in its sub menu	Press <Enter> to enter next page for detail hard druve settings
IDE Channel 0 Slave		
Video	EGA/VGA CGA 40 CGA 80 MONO	Select the default video device
Halt On	All Errors No Errors All , But Keyboard	Allows you to determine whether the system will stop for an error during the POST.
Base Memory	639K	Displays the amount of conventional memory detected during boot up
Extended Memory	N/A	Displays the amount of extended memory detected during boot up
Total Memory	N/A	Displays the total memory available in the system

4.4 IDE Adaptors Setup Menu

The IDE adapters control the SATA devices, such as hard disk drive or CD-ROM drive. It uses a separate sub menu to configure each hard disk drive.

Phoenix- AwardBIOS CMOS Setup Utility
IDE Channel 0 Master (&Slave)

IDE HDD Auto-Detection	[Press Enter]	Item Help
IDE Channel 0 Master	[Auto]	
Access Mode	[Auto]	Menu Level ►
Capacity	0 MB	To atuo-detect the HDD's size, head … on this channel
Cylinder	0	
Head	0	
Precomp	0	
Landing Zone	0	
Sector	0	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Note:
The oblique items are meaning base on what kind of storage device user employs.

■ **Menu Selections**

Item	Options	Description
SATA HDD Auto-detection	Press Enter	Press Enter to auto-detect the HDD on this channel. If detection is successful, it fills the remaining fields on this menu.
IDE Channel 0 Master	None Auto Manual	Selecting 'manual' lets you set the remaining fields on this screen. Selects the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc. Note: PRECOMP=65535 means NONE !
Access Mode	CHS, LBA Large, Auto	Choose the access mode for this hard disk
Capacity	Auto Display your disk drive size	Disk drive capacity (Approximated). Note that this size is usually slightly greater than the size of a formatted disk given by a disk checking program.
The following options are selectable only if the 'IDE Primary Master' item is set to 'Manual'		
Cylinder	Min=0, Max=65535	Set the number of cylinders for hard disk
Head	Min=0, Max=255	Set the number of read/write heads
Precomp	Min=0, Max=65535	**** Warning: Setting a value of 65535 means no hard disk
Landing zone	Min=0, Max=65535	****
Sector	Min=0, Max=255	Number of sectors per track

4.5 Advanced BIOS Features

This section allows you to configure your system for basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.

Phoenix- AwardBIOS CMOS Setup Utility
Advanced BIOS Features

▶ CPU Feature	[Press Enter]	Item Help
▶ Hard Disk Boot Priority	[Press Enter]	
Virus Warning	[Disabled]	Menu Level ▶
CPU L1 &L2 Cache	[Enabled]	
Hyper-Threading Technology	[Enabled]	
Quick Power On Self Test	[Enabled]	
First Boot Device	[CDROM]	
Second Boot Device	[CDROM]	
Third Boot Device	[LS120]	
Boot Other Device	[Enabled]	
Boot up NumLock Status	[On]	
Gate A20 Option	[Fast]	
Typematic Rate Setting	[Disabled]	
X Typematic Rate (Chars/Sec)	6	
X Typematic Delay (Msec)	250	
Security Option	[Setup]	
X APIC Mode	Enabled	
MPS Version Control For OS	[1.4]	
OS Select For DRAM > 64MB	[Non-OS2]	
Report No FDD For WIN 95	[No]	
Small Logo(EPA) Show	[Disabled]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Phoenix- AwardBIOS CMOS Setup Utility
CPU Feature

Delay Prior to Thermal	[16 Min]	Item Help
Limit CPUID MaxVal	[Disabled]	
C1E Function	[Auto]	Menu Level ▶
CPU C State Capability	[Disabled]	
Execute Disabled Bit	[Enabled]	
Virtualization Technology	[Enabled]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Delay Prior to Thermal

The Delay Prior To Thermal BIOS feature controls the activation of the Thermal Monitor's automatic mode. It allows you to determine when the Pentium 4's Thermal Monitor should be activated in automatic mode after the system boots.For example, with the default value of 16 Minutes, the BIOS activates the Thermal Monitor in automatic mode 16 minutes after the system starts booting up.

The choice: 4 Min, 8 Min, 16 Min, 32 Min.

Limit CPUID MaxVal

Allows you to determine whether to limit CPUID maximum value.

The choice: Enabled, Disabled.

C1E Function

CPU C1E Function Select.

The choice: Auto, Disabled.

CPU C State Capability

The choice: Disabled , C2 , C4 , C6.

Execute Disabled Bit

When disabled, forces the XD feature flag to always return 0.

The choice: Enabled, Disabled.

Virtualization Technology

When enable, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology

The choice: Enabled, Disabled.

Phoenix- AwardBIOS CMOS Setup Utility
Hard Disk Boot Priority

1. Bootable ADD-in Cards	Item Help
	Menu Level ▶ Use < ↑ > or < ↓ > to select a device, then press <+> to move it up, or <-> to move it down the list. Press <ESC> to exit this menu.
↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults	

Hard Disk Boot Priority

Select Hard Disk Boot Device Priority. Use < ↑ > or < ↓ > to select a device, then press <+> to move it up, or <-> to move it down the list. Press <ESC> to exit this menu.

Virus Warning

Allow you to choose the Virus warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep.

Enabled	Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.
Disabled	No warning message will appear when anything attempts to access the boot sector or hard disk partition table.

CPU L1 &L2 Cache

This setting enables the CPU internal cache (L1&L2 cache)

The choice: Enabled, Disabled

Hyper-Threading Technology

Please note that this feature is only working for operating system with multi processors mode supported.

The choice: Enabled, Disabled

Quick Power On Self Test

Allows the system skip certain tests while booting. This will decrease the time needed to boot the system.

Enabled	Enable Cache
Disabled	Disable Cache

First/Second/Third Boot Device

Select your Boot Device Priority.

The choice: LS120, Hard Disk, CDROM, ZIP 100, USB-FDD, USB-ZIP, USB-CDROM , Legacy LAN and Disabled.

Boot Other Device

Select your Boot Device Priority.

The choice: Enabled, Disabled.

Boot Up NumLock Status

Select power on state for NumLock.

The choice: Off, On.

Gate A20 Option

Fast-lets chipsets control GateA20 and Normal – a pin in the keyboard controller controls GateA20. Default is fast.

The choice: Normal, Fast.

Typematic Rate Setting

Keyboard repeat at a rate determined by the keyboard controller – when enabled, the typematic rate and typematic delay can de select.

The choice: Disabled, Enabled.

※Typematic Rate (Chars/sec)

The rate is which character repeats when you hold down a key.

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

※Typematic delay (Msec)

The delay before keystrokes begin to repeat.

The choice: 250, 500, 750, and 1000. (Default 250)

Security Option

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

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

※APIC Mode

Advanced Programmable interrupt controller. This option allows system to have Intel's new PIC standard supporting more interrupt lines for onboard devices.
Note: This option should be only enabled when system is running on ACPI power management mode.

The choice: Disabled.

MPS Version Control For OS

MultiProcessor Specification Support.

The choice: 1.1, 1.4

OS Select For DRAM > 64MB

Select OS/2 only if you are running OS/2 operating system with greater than 64MB of RAM on the system.

The choice: Non-OS2, OS2.

Report No FDD for WIN 95

Select "Yes" to release IRQ6 when the system contains no floppy drive, for compatibility with Windows 95 logo certification. In the Integrated Peripherals screen, select Disabled for the Onboard FDD Controller field.

The choice: No, Yes.

Small Logo (EPA) Show

The choice: Enabled, Disabled.

4.6 Advanced Chipset Features

This section allows you to configure the system based on the specific features of the Intel US15W chipset. This chipset manages bus speeds and access to system memory resources, such as DDR2 SDAM. It must be stated that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for the system. The only time user might consider making any changes would be if you discovered that data was being lost while during system operation.

Phoenix- AwardBIOS CMOS Setup Utility
Advanced Chipset Features

DRAM Timing Selectable	By SPD	Item Help
SLP_S4# Assertion Width	[4 to 5 Sec.]	
System BIOS Cacheable	[Enabled]	Menu Level ▶
Video BIOS Cacheable	[Disabled]	
*** VGA Setting ***		
On-Chip Frame Buffer Size	[8MB]	
Boot Display	[LVDS]	
LCD Panel Type	[1024x768 generic]	
Panel Scaling	[Auto]	
BIA Control	[VBIOS Default]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

SLP_S4# Assertion Width.

The choice: 1 to 2 Sec, 2 to 3 Sec, 3 to 4 Sec, 4 to 5 Sec.

System BIOS Cacheable.

When enabled, the system BIOS ROM at F0000h-FFFFFh.

The choice: Enabled, Disabled.

Video BIOS Cacheable.

When enabled, the video BIOS ROM at C0000h-F7FFFh.

The choice: Enabled, Disabled.

On-Chip Frame Buffer Size

Users can set the display memory size that shared from main memory.
The choice: 1MB, 4MB, 8MB.

Boot Display

The choice: LVDS, CRT-SDVO.

LCD Panel Type

The choice: 640x480 generic, 800x600 generic, 1024x768 generic.

Panel Scaling

The choice: Auto, Force, Off.

BIA Control

Default.: VBIOS Default.

4.7 Integrated Peripherals

Phoenix- AwardBIOS CMOS Setup Utility
Integrated Peripherals

▶ Onboard Device	[Press Enter]	Item Help
▶ Super IO Device	[Press Enter]	
▶ PCI Express Root Port Func	[Press Enter]	Menu Level ▶
Onboard Lan Boot ROM	[Disabled]	
Watch Dog Timer Select	[Disabled]	
▶ USB Device Setting	[Press Enter]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Onboard Device.

Phoenix- AwardBIOS CMOS Setup Utility
Onboard Device

Interl HD Audio Controller	[Auto]	Item Help
USB Client Controller	[Disabled]	
SDIO/MMC Controller	[Enabled]	Menu Level ▶

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Interl HD Audio Controller
The choice: Auto, Disabled.

USB Client Controller
The choice: Enabled, Disabled.

SDIO/MMC Controller
The choice: Enabled, Disabled.

SuperIO Device

Phoenix- AwardBIOS CMOS Setup Utility
SuperIO Device

Onboard Serial Port 1	[3F8/IRQ4]	Item Help
Onboard Serial Port 2	[2F8/IRQ3]	
UART Mode Select	[Normal]	Menu Level ►
X RxD , TxD Active	Hi , Lo	
X IR Transmission Delay	Enable	
X UR2 Duplex Mode	Half	
XUse IR Pins	IR-Rx2Tx2	
Onboard Parallel Port	[378/IRQ7]	
Parallel Port Mode	[SPP]	
X EPP Mode Select	EPP1.7	
X ECP Mode Use DMA	3	
PWRON After PWR-Fail	[Off]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Onboard Serial Port 1/Port 2
Select an address and corresponding interrupt for the first and second serial ports.

The choice: Disabled, 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, Auto.

UART Mode Select
This item allows users to select Infrared transmission mode.

IrDA	Select IrDA mode transmission
ASKIR	Select ASKIR mode transmission
Normal	Disable Infrared function

RxD, TxD Active
This item is to configure Infrared transmission rate. Four options are available:

Hi, Hi	High rate for receiving / High rate for transmitting
Hi, Lo	High rate for receiving / Low rate for transmitting
Lo, Hi	Low rate for receiving / High rate for transmitting
Lo, Lo	Low rate for receiving / Low rate for transmitting

IR Transmission Delay
This option will be available when IR is enabled.

The choice: Enabled, Disabled.

UR2 Duplex Mode
The available choices are full duplex mode and half duplex mode

The choice: Full, Half.

Use IR Pins
The available choices are IR-Rx2Tx2/ RxD2, TxD2.

The choice: IR-Rx2Tx2 / RxD2, TxD2.

Onboard Parallel Port

Select an address and corresponding interrupt for t Parallel port.

The choice: 378/IRQ7, 278/IRQ5, 3BC/IRQ7,

Parallel Port Mode

Selects an operating mode for the onboard parallel (LPT) port.

The choice: SPP, EPP, ECP, ECP+EPP, Normal

EPP Mode Select

The choice:EPP1.7, EPP1.9

ECP Mode Use DMA

Selects DMA channel for the LPT port in ECP mode. This item is configurable only if Parallel Port Mode is set to ECP or ECP+EPP mode.

The choice: 3 , 1

PWRON After PWR-Fail

This item allows user to configure the power status of using ATX power supply after a serious power loss occurs.

The choice: Off, On, Former-Sts

PCI Express Root Port Func.

Phoenix- AwardBIOS CMOS Setup Utility
PCI Express Root Port Func

PCI Express Port 1	[Auto]	Item Help
PCI Express Port 2	[Auto]	Menu Level ▶
↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults		

PCI Express Port 1 / 2

The choice: Auto, Enabled, Disabled.

Onboard Lan Boot ROM

Allows you to decide whether to activate the boot ROM integrated with the onboard LAN chip.

The choice: Enabled, Disabled.

Watch Dog Timer Select

This BIOS testing option is able to reset the system according to the selected table.

The choice: Disabled, 10 Sec, 20 Sec, 30 Sec, 40 Sec, 1 Min, 2 Min, and 4 Min.

USB device Setting

Phoenix- AwardBIOS CMOS Setup Utility
USB Device Setting

USB 1.0 Controller	[Enabled]	Item Help
USB 2.0 Controller	[Enabled]	Menu Level ▶
USB Operation Mode	[High Speed]	[Enabled] or [Disabled] universal host controller interface for universal serial bus.
USB Keyboard Function	[Enabled]	
USB Storage Function	[Enabled]	
*** USB Mass Storage Device Boot Setting ***		
↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults		

USB 1.0 Controller

[Enabled] or [Disabled] Universal host controller interface for universal serial bus.

The choice: Enabled, Disabled.

USB 2.0 Controller

[Enabled] or [Disabled] Enhanced host controller interface for universal serial bus.

The choice: Enabled, Disabled.

USB Operation Mode

Auto decides USB device operation mode. [High speed]: If USB device was high speed device, then it operated on high speed mode. If USB device was full/low speed device, then it operated on full/low speed mode; [Full/Low speed]: All of USB device operated on Full/Low speed mode.

The choice: High Speed, Full/Low Speed.

USB Keyboard Function

[Enabled] or [Disabled] Legacy support of USB keyboard.

The choice: Disabled, Enabled.

USB Storage Function

[Enabled] or [Disabled] Legacy support of USB Mass Storage.

The choice: Disabled, Enabled.

4.8 Power Management Setup

The Power Management Setup allows configuration of the system to most effectively save energy while operating in a manner consistent with your own style of computer use.

Phoenix- AwardBIOS CMOS Setup Utility
Power Management Setup

ACPI Function	[Enabled]	Item Help
ACPI Suspend Type	[S3(STR)]	
Power Management	[User Define]	Menu Level ▶
Video Off Method	[DPMS]	
Video Off In Suspend	[Yes]	
Suspend Type	[Stop Grant]	
Suspend Mode	[Disabled]	
HDD Power Down	[Disabled]	
Soft-Off by PWR-BTTN	[Instant-Off]	
Wake-Up by PCI card	[Enabled]	
Resume by Alarm	[Disabled]	
X Date(of Month) Alarm	0	
X Time(hh:mm:ss) Alarm	0 : 0 :0	
]		

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

ACPI Function

This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI).

The choice: Enabled, Disabled.

ACPI Suspend Type

To decide which ACPI suspend mode to use.

The choice: S3 (STR) only.

Power Management

This category allows selecting the type (or degree) of power saving and is directly related to "HDD Power Down", "Suspend Mode".

There are three selections for Power Management, three of which have fixed mode settings.

Min. Power Saving	Minimum power management. Suspend Mode = 1 Hour, and HDD Power Down = 15 Min.
Max. Power Saving	Maximum power management. Suspend Mode = 1 Min., and HDD Power Down = 1 Min.
User Defined	Allows you to set each mode individually. When not disabled, Suspend Mode ranges from 1 min. to 1 Hour and HDD Power Down ranges from 1 Min. to 15 Min.

Video off Method

This determines the manner in which the monitor is blanked.

V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	Initial display power management signaling.

Video Off In Suspend

This allows user to enable/disable video off in Suspend Mode.

The choice: Yes, No.

Suspend Type

The choice: Stop Grant, Power On suspend.

Suspend Mode

After the set time of system inactivity, all devices except CPU will be shut off.

The choice: 1 min, 2 min, 4 min, 8 min, 12 min, 20min, 30 min, 40 min, 1 hour.

HDD Power Down

After the set time of system inactivity, the Hard disk drive will be power down while all other devices remain active.

The choice: 1 to 15 minutes.

Soft-Off by PWR-BTTN

This item allows users to set the time to remove the power after the power button is pressed.

The choice: Instant-Off, Delay 4 Sec.

Wake-Up By PCI card/ LAN

Allows the system to be awakened from an ACPI sleep state by a wake-up signal from a PCI or PCIe device. Note: To use this function, you need an ATX power supply providing at least 1A on the +5VSB lead.

The choice: Disabled, Enabled.

Resume by Alarm

This item allows users to enable/disable the resume by alarm function. When "Enabled" is selected, system using ATX power supply could be powered on if a customized time and day is approached.

The choice: Enabled, Disabled.

※Date(of Month) Alarm

When "Resume by Alarm" is enabled, this item could allow users to configure the date parameter of the timing dateline on which to power on the system.

The choice: 0 ~ 31.

※Time (hh:mm:ss) Alarm

When "Resume by Alarm" is enabled, this item could allow users to configure the time parameter of the timing dateline on which to power on the system.

The choice: hh (0~23), mm (0~59), ss (0 ~59).

4.9 PnP/PCI Configurations

This section describes configuring the PCI bus system. PCI, or **P**ersonal **C**omputer **I**nterconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components.

This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

Phoenix- AwardBIOS CMOS Setup Utility
PnP/PCI Configurations

Init Display First	[PCI Slot]	Item Help
Reset Configuration Data	[Disabled]	
Resources Controlled By	[Auto(ESCD)]	Menu Level ►
X IRQ Resources	Press Enter	
PCI/VGA Palette Snoop	[Disabled]	
** PCI Express relative items **		
Maximum Payload Size	[128]	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Init Display First

The choice: PCI Slot, Onboard, PCIEx.

Reset Configuration Data

Default is Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot boot.

The choice: Enabled, Disabled.

Resource Controlled By

BIOS can automatically configure the entire boot and plug and play compatible devices. If set to Auto, IRQ DMA and memory base address fields can not be selected, since BIOS automatically assigns them.

The choice: Auto (ESCD), Manual.

※IRQ Resources

When resources are controlled manually, assign each system interrupt a type, depending on the type of device using the interrupt.

The choice: Press Enter.

IRQ-3/IRQ-4/IRQ-5/IRQ-7/IRQ-9/IRQ-10/IRQ-11/IRQ-12/IRQ-14/IRQ-15 assigned to.

The choice: PCI Device, Reserved.

PCI/VGA Palette Snoop

Legacy ISA for devices compliant with the original PC AT bus specification, PCI PnP for devices compliant with the plug and play standard whether designed for PCI bus architecture.

The choice: Enabled, Disabled.

Maximum Payload Size.

Default 128.

4.10 PC Health Status

Phoenix- AwardBIOS CMOS Setup Utility
PC Health Status

Shutdown Temperature	[Disabled]	Item Help
CPU Warning Temperature	[Disabled]	
Current System Temp	49℃/ 120℉	Menu Level ▶
SYS Fan Speed	0 RPM	
+12 V	0.24 V	
3.3 V	2.11 V	
VCC(V)	5.37 V	
VBAT(V)	3.18 V	
3VSB(V)	3.18 V	

↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

Shutdown Temperature
The shutdown temperature for the computer shuts down by itself.

The choices : Disabled, 60℃/140℉, 65℃/149℉, 70℃/158℉.

CPU Warning Temperature
This item allows you to set a temperature above which the system will start the beeping warning. Default setting is disabled. This function will only with "ACPI" power management and "S3 (STR)" suspends type.

The choices : Disabled, 50℃/122℉, 53℃/127℉, 56℃/133℉, 60℃/140℉, 63℃/145 ℉, 66℃/151℉, 70℃/158℉.

4.11 Default Menu

Selecting "Defaults" from the main menu shows two options which are described below,

Load Fail-Safe Defaults

When <Enter> is pressed, a confirmation dialog box with a message similar to:

Load Fail-Safe Defaults (Y/N) ? N

Pressing 'Y' loads the BIOS default values for the most stable, minimal-performance system operations.

Load Optimized Defaults

When <Enter> is pressed, a confirmation dialog box with a message similar to:

Load Optimized Defaults (Y/N) ? N

Pressing 'Y' loads the default values that are factory settings for optimal performance system operations.

4.12 Supervisor/User Password Setting

Either supervisor or user password can be setup, or both of then. The differences between are:

Set Supervisor Password : can enter and change the options of the setup menus.

Set User Password : just can only enter but do not have the right to change the options of the setup menus. When selecting this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD

Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable a password, just press <Enter> when prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will reboot and Setup can be entered freely.

PASSWORD DISABLED

When a password has been enabled, user will be prompted to enter it every time user tries to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of the computer.

User may determine when the password is required within the BIOS Features Setup Menu and its Security option (see Section 3). If the Security option is set to "System", the password will be required both at boot and at entry to Setup. If set to "Setup", prompting only occurs when trying to enter Setup.

4.13 Exiting Selection

Save & Exit Setup

Pressing <Enter> on this item asks for confirmation:

Save to CMOS and EXIT (Y/N)? Y

Pressing "Y" stores the selections made in the menus in CMOS – a special section of memory that stays on after system off. During subsequnet booting of computer, the BIOS configures the system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

Exit Without Saving

Pressing <Enter> on this item asks for confirmation:

Quit Without Saving (Y/N)? N

This allows user to exit Setup without storing in CMOS any change. The previous selections remain in effect. This exits the Setup utility and restarts your computer.

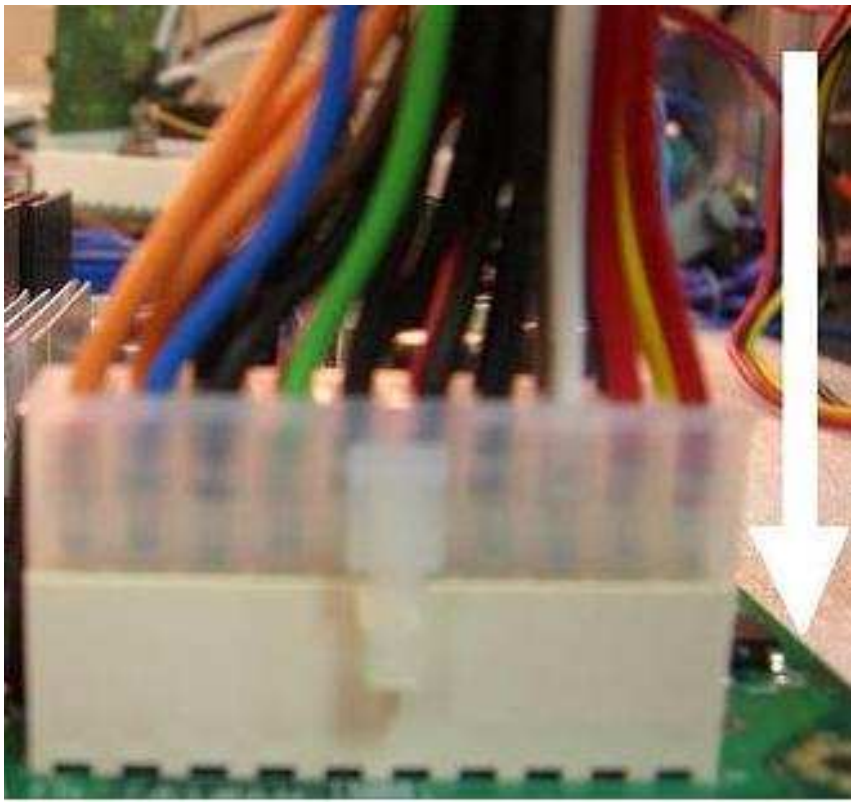
Chapter 5 Troubleshooting

This chapter provides a few useful tips to quickly get PQ7-M100G running with success. As basic hardware installation has been addressed in Chapter 2, this chapter will primarily focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

5.1 Hardware Quick Installation

ATX Power Setting

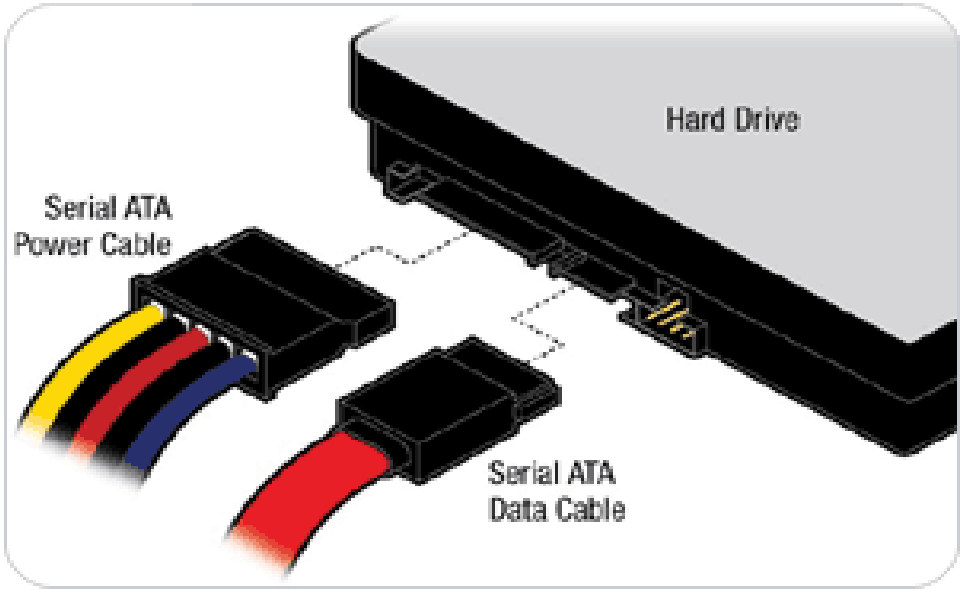
Unlike other Single board computer, PQ7-M100G supports ATX only. Therefore, there is no other setting that really needs to be set up. However, there are only two connectors that must be connected—PW1 (20 pins Power Connector) Figure.



Serial ATA Hard Disk Setting for IDE

Each Serial ATA channel can only connect to one SATA hard disk at a time; there are total Four connectors, J27/ J28/J32/J33. The installation of Serial ATA is simpler and easier than IDE, because SATA hard disk doesn't require setting up Master and Slave, which can reduce mistake of hardware installation. All you need to do is to plug in two cables and enable SATA in System BIOS.

The VIA VT6421A chipset Controller **Dual Channel SATA devices (J27/ J28)**& **Single Channel Ultra ATA (J30)**.



5.2 BIOS Setting

It is assumed that users have correctly adopted modules and connected all the devices cables required before turning on ATX power.keyboard, mouse, USB floppy drive, SATA hard disk, VGA connector, device power cables, ATX accessories are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with PQ7-M100G, it is recommended, when going with the boot-up sequence, to hit "DEL" key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

Loading the default optimal setting

When prompted with the main setup menu, please scroll down to "**Load Optimal Defaults**", press "Enter" and "Y" to load in default optimal BIOS setup. This will force your BIOS setting back to the initial factory configuration. It is recommended to do this so you can be sure the system is running with the BIOS setting that Portwell has highly endorsed. As a matter of fact, users can load the default BIOS setting any time when system appears to be unstable in boot up sequence.

Auto Detect Hard Disks

In the BIOS => Standard CMOS setup menu, pick up any one from Primary/Secondary Master/Slave IDE ports, and press "Enter". Setup the selected IDE port and its access mode to "Auto". This will force system to automatically pick up the IDE devices that are being connected each time system boots up.

Improper disable operation

There are too many occasions where users disable a certain device/feature in one application through BIOS setting. These variables may not be set back to the original values when needed. These devices/features will certainly fail to be detected.

When the above conditions happen, it is strongly recommended to check the BIOS settings. Make sure certain items are set as they should be. These include the COM1/ COM2 ports, USB ports, external cache, on-board VGA and Ethernet.

It is also very common that users would like to disable a certain device/port to release IRQ resource. A few good examples are

Disable COM1 serial port to release IRQ #4
Disable COM2 serial port to release IRQ #3
Etc…

A quick review of the basic IRQ mapping is given below for your reference.

IRQ#	Description
IRQ #0	System Counter
IRQ #1	Keyboard
IRQ #2	Programmed Controller
IRQ #3	COM2
IRQ #4	COM1
IRQ #5	Network Controller , USB 2.0 EHCI Controller
IRQ #6	
IRQ #7	Parallel Port
IRQ #8	CMOS Clock
IRQ #9	Display Controller , ACPI Controller , USB 1.0/1.1 UHCI Controller , USB CNTRLR PROG INTERFACE , Multimedia Controller , BASE SYS PERIPHERALS
IRQ #10	Network Controller , USB 1.0/1.1 UHCI Controller, BASE SYS PERIPHERALS
IRQ #11	RAID Controller ,USB 1.0/1.1 UHCI Controller , BASE SYS PERIPHERALS
IRQ #12	PS/2 mouse
IRQ #13	Data Processor
IRQ #14	IDE Controller
IRQ #15	

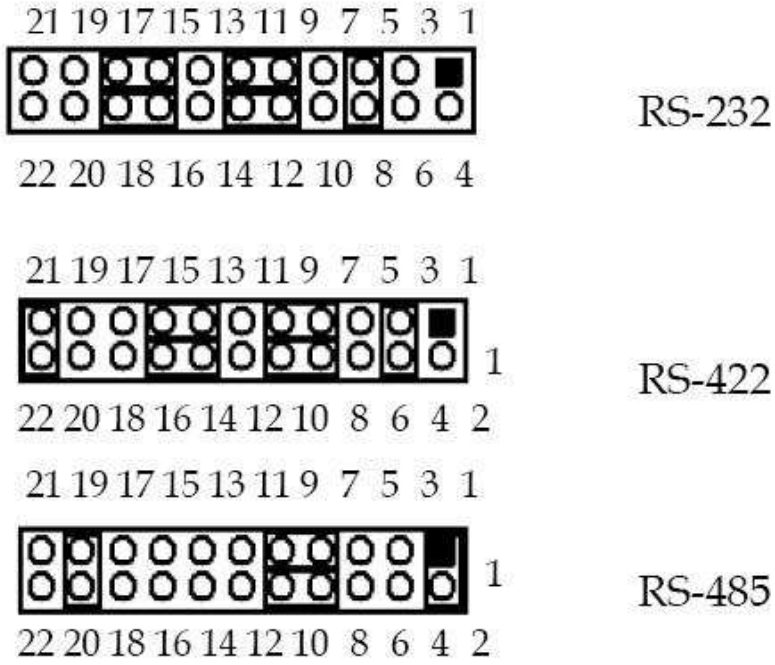
It is then very easy to find out which IRQ resource is ready for additional peripherals. If IRQ resource is not enough, please disable some devices listed above to release further IRQ numbers.

5.3 FAQ

Information & Support

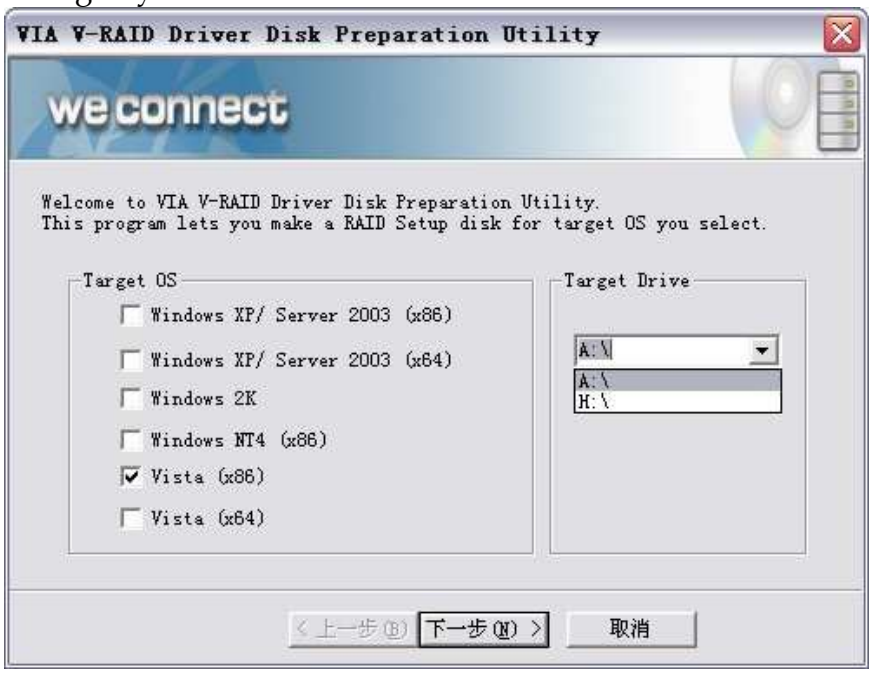
Question: How can I change COM port to RS-232/RS-422/RS-485 mode?
Answer: You can short JP3 pin header to change RS-232/RS-422/RS-485 mode.

JP3		COM1(J2) Interface Selection (JP3)
	Function	JP3
Default	RS-232	5-6,9-11,10-12,15-17,16-18 Short
	RS-422	3-4,7-9,8-10,13-15,14-16,21-22 Short
	RS-485	1-2,7-9,8-10,19-20 Short



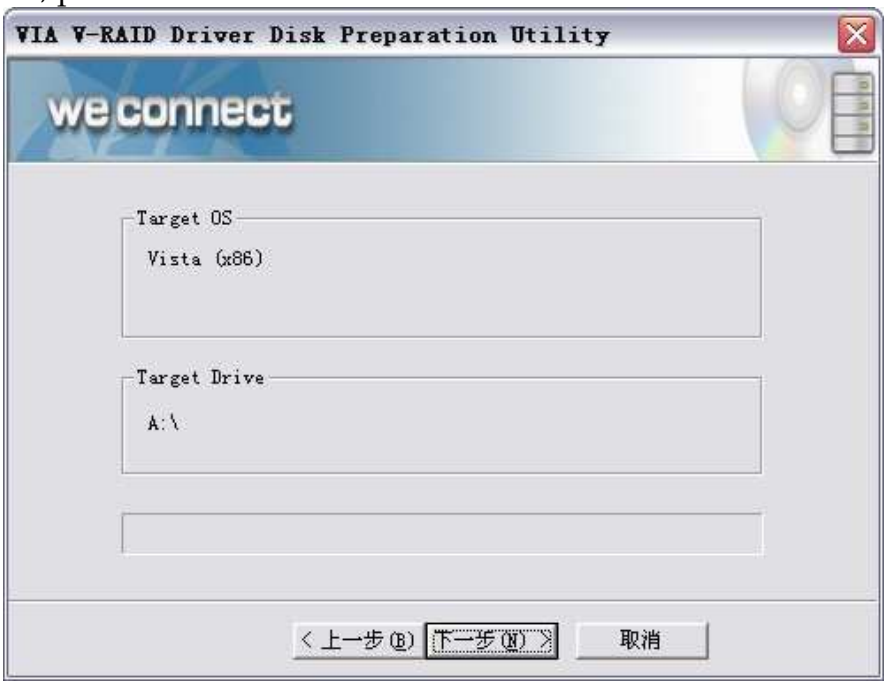
Question: How to Set BIOS to Boot from VIA V-RAID SATA/IDE CD\DVD Devices (J27/ J28)& (J30)?
Answer:
※1. Start your computer with the CD in the CD/DVD Device.
2. Reboot the system and press <Del> during the Power-On Self-Test (POST) to enter the BIOS Setup Utility.
3. Go to the Advanced BIOS Features > First Boot Device > CD/DVD Device Mode item in the BIOS.
4. Save your changes and Exit Setup.

Question: How to Create the VIA V-RAID Driver Disk?
Answer:
Step#1:
Please select the Operation System firstly, and the utility will scan the available drive(s) according to your selection.

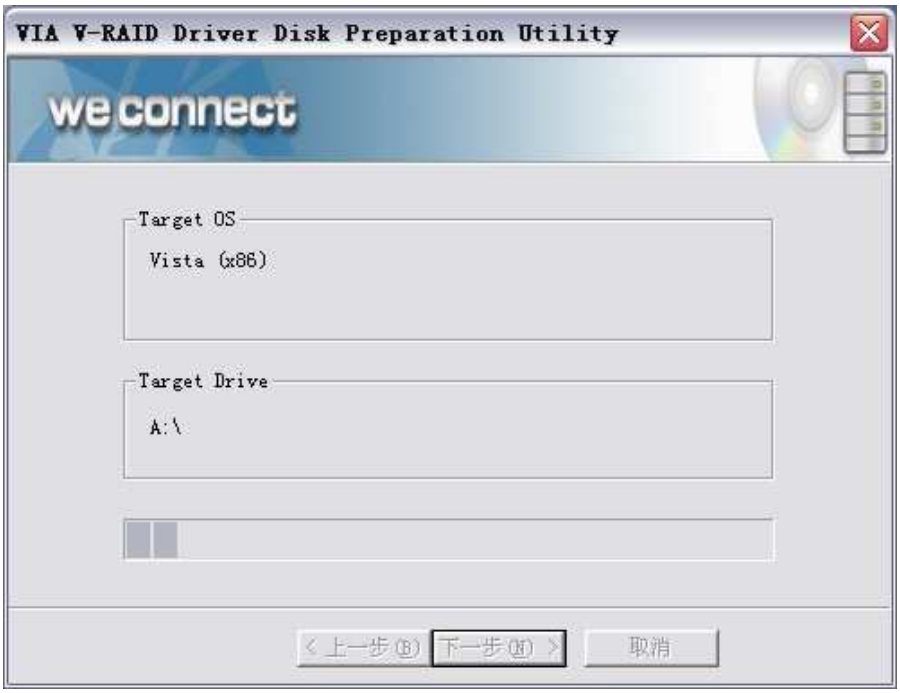


Then please select one drive and click 'Next>'.

Step#2:
After you confirm the information of target Operation System(s) and drive, based on your selection, please click 'Next>' to create the driver disk.

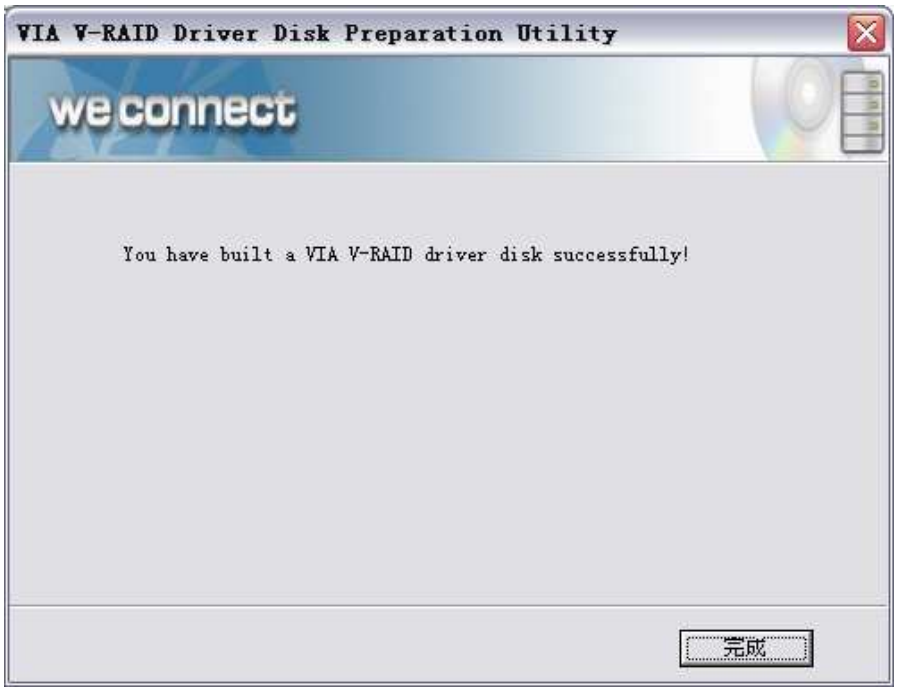


Copying…



The progress bar will display the working status.

Step#3:
You will get the result notification here.



Start your computer with the Microsoft Windows OS CD in the CD drive.
The Microsoft Windows OS Setup window appears with the following message at the bottom of the screen: Press <F6> if you need to install a third party VIA V-RAID Driver.

Note:
Please visit our technical web site at
http://www.portwell.com.tw
For additional technical information, which is not covered in this manual, you can mail to tsd@mail.portwell.com.tw or you can also send mail to our sales, they wull be very delighted to forward them to us.

System Memory Address Map

Each On-board device in the system is assigned a set of memory addresses, which also can be identical of the device. The following table lists the system memory address used for your reference.

Memory Area	Size	Device Description
0000-003F	1K	Interrupt Area
0040-004F	0.3K	BIOS Data Area
0050-006F	0.5K	System Data
0070-0E2E	54K	DOS
0E2F-0F6B	5K	Program Area
0F6C-9EFF	574K	【Available】
= Conventional memory ends at 639K =		
9F00-9F7F	2K	Unused
9F80-9FFF	2K	Extended Bios Area
A000-AFFF	64K	VGA Graphics
B000-B7FF	32K	Unused
B800-BFFF	32K	VGA Text
C000-CE5F	57K	Video ROM
CE60-EFFF	134K	Unused
F000-FFFF	64K	System ROM
HMA	64K	First 64k

Interrupt Request Lines (IRQ)

Peripheral devices can use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

IRQ#	Current Use	Default Use
IRQ 0	System ROM	System Timer
IRQ 1	System ROM	Keyboard Event
IRQ 2	【Unassigned】	Usable IRQ
IRQ 3	System ROM	COM 2
IRQ 4	System ROM	COM 1
IRQ 5	【Unassigned】	Usable IRQ
IRQ 6	System ROM	Diskette Event
IRQ 7	Unused	Usable IRQ
IRQ 8	System ROM	Real-Time Clock
IRQ 9	【Unassigned】	Usable IRQ
IRQ 10	【Unassigned】	Usable IRQ
IRQ 11	【Unassigned】	Usable IRQ
IRQ 12	System ROM	IBM Mouse Event
IRQ 13	System ROM	Coprocessor Error
IRQ 14	System ROM	Hard Disk Event
IRQ 15	【Unassigned】	Usable IRQ