

PFM-945C

Intel Navy Pier N270 Processor
Intel 945GSE+ICH7-M (82801GB)

18-bit LVDS TFT Panel

1 SATA, 1 Compact Flash

4 COM, 4 USB

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Packing List

Before you begin installing your card, please make sure that the following materials have been shipped:

- PFM-945C
- Quick Installation Guide
- Utility CD
- Cable kit for PFM-945C
- Jumper
- Short-copper

Note:

If any of these items should be missing or damaged, please contact your distributor or sales representative immediately.

Contents

Chapter 1 General Information

1.1 Introduction	1-2
1.2 Features	1-3
1.3 Specifications	1-4

Chapter 2 Quick Installation Guide

2.1 Safety Precautions	2-2
2.2 Location of Connectors and Jumpers	2-3
2.3 Mechanical Drawing	2-5
2.4 List of Jumpers	2-7
2.5 List of Connectors	2-8
2.6 Setting Jumpers	2-9
2.7 AT/ATX (S1)	2-10
2.8 Clear CMOS (JP1)	2-10
2.9 PCI104 VIO Selection (JP2)	2-10
2.10 LCD Inverter Voltage Selection (JP3)	2-10
2.11 LVDS-LCD Voltage Selection (JP4)	2-11
2.12 COM2 Ring/+5V/+12V Selection (JP5)	2-11
2.13 TOUCH SCREEN Selection (JP6)	2-11
2.14 Front Panel Connector-1 (CN1)	2-11
2.15 Front Panel Connector-2 (CN2)	2-12
2.16 PS2 Keyboard / Mouse Connector (CN3)	2-12
2.17 LCD Inverter Connector (CN4)	2-12

2.18 PCI-104 Connector (CN5).....	2-13
2.19 Audio Connector Line-IN/Line-OUT/Mic-IN/CDIN (CN6)	2-14
2.20 Power Connector (CN7)	2-14
2.21 SATA Power Connector (CN8).....	2-14
2.22 10 /100 Base-TX Ethernet Connector (CN9)	2-15
2.23 2nd USB Connector (CN10).....	2-15
2.24 1st USB Connector (CN11)	2-15
2.25 3rd USB Connector (CN12)	2-15
2.26 4th USB Connector (CN13).....	2-16
2.27 SATA Connector (CN14)	2-16
2.28 LVDS-LCD Connector (CN15)	2-16
2.29 CRT Connector (CN16)	2-17
2.30 COM4 RS-232 Serial Port Connector (CN17)	2-18
2.31 COM3 RS-232 Serial Port Connector (CN18).....	2-18
2.32 COM2 RS-232 Serial Port Connector (CN19).....	2-18
2.33 COM1 RS-232 Serial Port Connector (CN20).....	2-19
2.34 PCI-E/104 Connector (CN21).....	2-19
2.35 FAN Connector (CN22)	2-21
2.36 Touch Screen Connector (CN23).....	2-21
2.37 External RTC Connector (BAT1).....	2-21

Chapter 3 Award BIOS Setup

3.1 System Test and Initialization.....	3-2
3.2 Award BIOS Setup.....	3-3

Chapter 4 Driver Installation

4.1 Software Drivers	4-2
4.2 Necessary to know	4-3
4.3 Installation	4-4

Appendix A Programming The Watchdog Timer

A.1 Programming	A-2
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Appendix B I/O Information

B.1 I/O Address Map	B-2
B.2 Memory Address Map	B-2
B.3 IRQ Mapping Chart	B-3
B.4 DMA Channel Assignments	B-3

Appendix C Mating Connector

C.1 List of Mating Connectors and Cables	C-2
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Chapter

1

**General
Information**

1.1 Introduction

AAEON Technology, a leading company in embedded boards manufacturing with a full range of PC/104 CPU Modules, launches a brand new PC/104 CPU Module-PFM-945C. Its compact size and rich functionality ensures the most cost effective and compatible module to coincide with your existing system planning devices.

PFM-945C adopts an Intel Navy Pier N270 Processor onboard that is more cost effective compared to other PC/104 CPU modules on the market. Although PFM-945C is a small board, it offers the full functions for customers demand. The chipset of PFM-945C deploys Intel 945GSE and ICH7-M (82801GBM) that makes this board achieve high performance. It features one 10/100Base-TX Ethernet ports, four USB 2.0 ports, four serial ports, watchdog timer and includes one PCI connector and PCIe/104 connector.

1.2 Features

- Intel Navy Pier N270 1.6GHz Processor onboard
- Onboard DDRII 533 Memory 512MB or 1GB
- 10/100 Base-TX Ethernet x 1
- 18-bit LVDS TFT Panel
- AC97 2.3 Code 2CH Audio
- SATA x 1, Compact Flash x 1
- USB 2.0 x 4, COM x 4
- PCI-104 or PCI/104-Express interface
- +12V Only Operation, ATX/AT Power Type
- Touch Screen, Back light controller(Optional)

1.3 Specifications

System

- Processor Intel Navy Pier
N270 1.6GHz processor
- System Memory On Board DDRII 533,
Max. 1GB (512MB or 1GB)
- Chipset Intel 945GSE+ICH7-M
(82801GBM)
- I/O Chipset SMSC3114-NU: 4 COM ports
- Ethernet Intel 82551ER
- BIOS SPI type - Award Plug & Play
BIOS – 2MB ROM
- Watchdog Timer ICH7-M
- RTC ICH7-M
- Hardware Monitor ICH7-M
- Expansion Interface PCI -104 socket x 1 & PCIe/104
socket x 1
- Power 12V Input AT/ATX
- LCD Power Voltage type:5V &12V (select by
jumper)
- Touch Controller Pen Mount 6300
- Operating Temperature 0°C ~ 60°C

I/O

- Storage Disk SATA II x 1
- Solid Storage Disk Supports CFD type I Slot
- Serial Port
COM 1, 3&4: RS-232
COM 2: RS232/ RS422/ RS485
(+5V,12V, Ring), RS-485
w/Auto flow and should isolate
from RS-232
- Parallel Port None
- USB Total Four USB 2.0
- K/B and Mouse One PS/2 Keyboard and one
PS/2 mouse support

Chapter

2

Quick Installation Guide

Notice:

The Quick Installation Guide is derived from Chapter 2 of user manual. For other chapters and further installation instructions, please refer to the user manual CD-ROM that came with the product.



2.1 Safety Precautions

Warning!

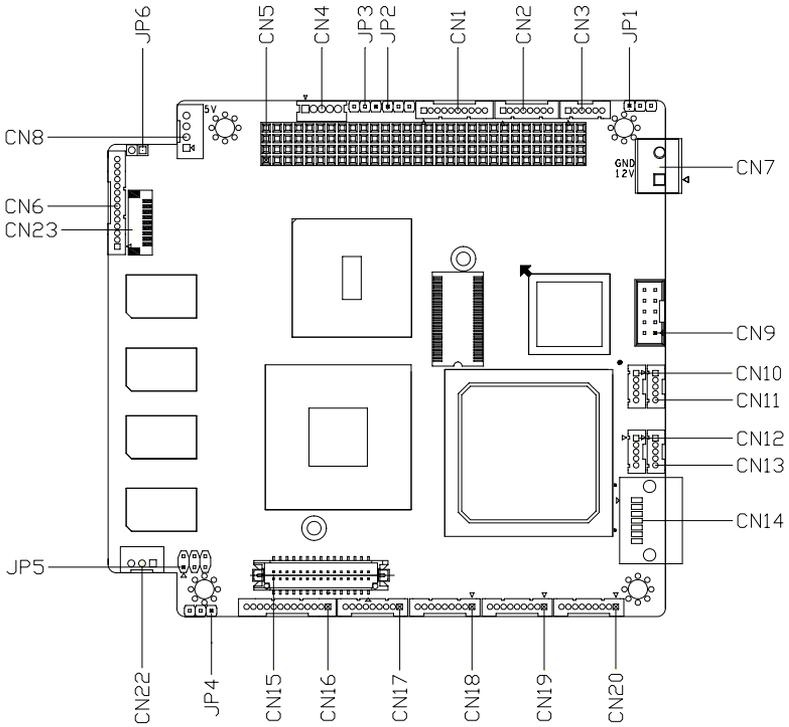
Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.

Caution!

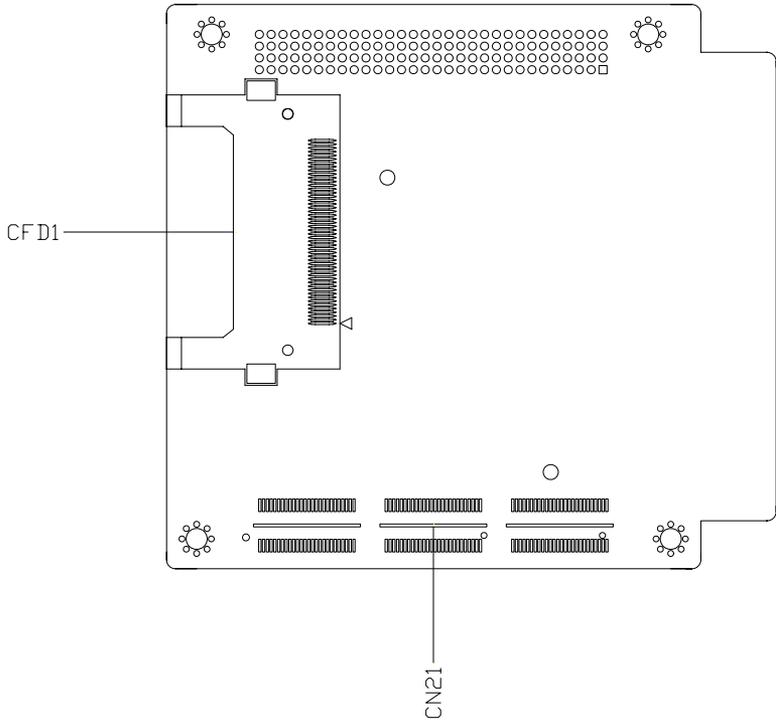
Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis

2.2 Location of Connectors and Jumpers

Component Side

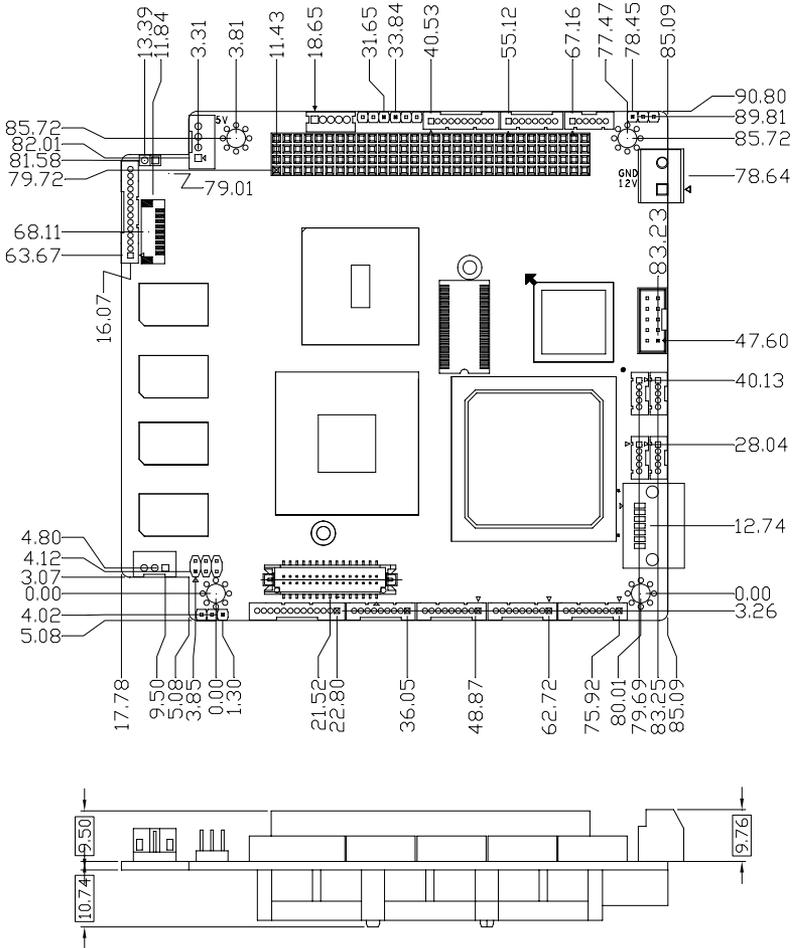


Solder Side

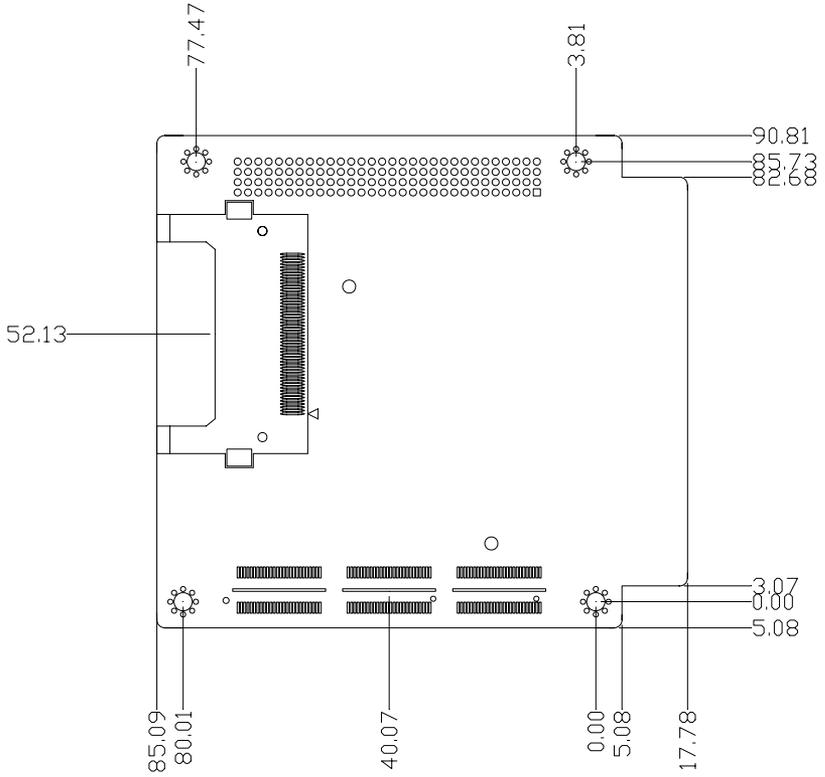


2.3 Mechanical Drawing

Component Side



Solder Side



2.4 List of Jumpers

The board has a number of jumpers that allow you to configure your system to suit your application.

The table below shows the function of each of the board's jumpers:

Jumpers

Label	Function
S1	AT/ATX
JP1	Clear CMOS
JP2	PCI104 VIO Selection
JP3	LCD INVERTER Voltage Selection
JP4	LVDS-LCD Voltage Selection
JP5	COM2 Ring/+5V/+12V Selection
JP6	Touch Screen 4,5,8 Wire Selection

2.5 List of Connectors

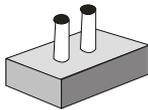
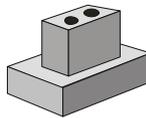
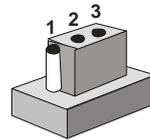
The board has a number of connectors that allow you to configure your system to suit your application. The table below shows the function of each board's connectors:

Label	Function
CN1	Front Panel Connector-1
CN2	Front Panel Connector-2
CN3	PS2 Keyboard / Mouse Connector
CN4	LCD Inverter Connector
CN5	PCI-104 Connector
CN6	Audio Connector
CN7	Power Connector
CN8	SATA Power Connector
CN9	10/100Base-TX Ethernet Connector
CN10	2nd USB Connector
CN11	1st USB Connector
CN12	3rd USB Connector
CN13	4th USB Connector
CN14	SATA Connector
CN15	LVDS-LCD Connector
CN16	CRT Connector
CN17	COM4 RS-232 Serial Port Connector
CN18	COM3 RS-232 Serial Port Connector
CN19	COM2 RS-232/422/485 Serial Port Connector
CN20	COM1 RS-232 Serial Port Connector
CN21	PCI-E/104 Connector
CN22	FAN Connector
CN23	Touch screen Connector
CFD1	CompactFlash Slot
BAT1	External RTC Connector

2.6 Setting Jumpers

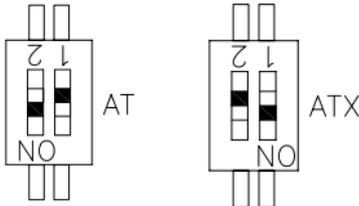
You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip.

To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2 or 2 and 3.

**OFF****ON****ON 2-3**

A pair of needle-nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any change. Generally, you simply need a standard cable to make most connections.

2.7 AT/ATX (S1)



S1	Function
1(ON), 2(OFF)	ATX
1(OFF), 2(ON)	AT (Default)

2.8 Clear CMOS (JP1)

JP1	Function
1-2	Protected (Default)
2-3	Clear

2.9 PCI104 VIO Selection (JP2)

JP2	Function
1-2	+5V
2-3	+3.3V(Default)

2.10 LCD Inverter Voltage Selection (JP3)

JP3	Function
1-2	+12V
2-3	+5V (Default)

2.11 LVDS-LCD Voltage Selection (JP4)

JP4	Function
1-2	+5V
2-3	+3.3V (Default)

2.12 COM2 Ring/+5V/+12V Selection (JP5)

JP5	Function
1-2	+12V
3-4	+5V
5-6	Ring (Default)

2.13 TOUCH SCREEN Selection (JP6)

JP6	Function
1-2	SHORT / 4,8 wire(Default)
1-2	OPEN / 5 wire

2.14 Front Panel Connector-1 (CN1)

Pin	Signal
1	Power On Button (+)
2	Power On Button (-)
3	External Buzzer (+)
4	External Buzzer (-)
5	IDE LED (+)
6	IDE LED (-)
7	Power LED (+)
8	Power LED (-)
9	Reset Switch (+)

10	Reset Switch (-)
----	------------------

2.15 Front Panel Connector-2 (CN2)

Pin	Signal
1	LAN Speed LED (+)
2	LAN Speed LED (-)
3	LAN Active LED (+)
4	LAN Active LED (-)
5	+3.3V
6	N.C
7	+3.3V
8	N.C

2.16 PS2 Keyboard / Mouse Connector (CN3)

Pin	Signal
1	KDAT
2	KCLK
3	GND
4	+KB_VCC
5	MDAT
6	MCLK

2.17 LCD Inverter Connector (CN4)

Pin	Signal
1	+5V/+12V
2	Adjust Backlight
3	GND
4	GND

2.18 PCI-104 Connector (CN5)

	A	B	C	D
1	GND	+5V_SB	+5V	AD00
2	VI/O	AD02	AD01	+5V
3	AD05	GND	AD04	AD03
4	C/BE0#	AD07	GND	AD06
5	GND	AD09	AD08	GND
6	AD11	VI/O	AD10	M66EN
7	AD14	AD13	GND	AD12
8	+3.3V	C/BE1#	AD15	+3.3V
9	SERR#	GND	PS0N#	PAR
10	GND	PERR#	+3.3V	PME#
11	STOP#	+3.3V	LOCK#	GND
12	+3.3V	TRDY#	GND	DEVSEL#
13	FRAME#	GND	IRDY#	+3.3V
14	GND	AD16	+3.3V	C/BE2#
15	AD18	+3.3V	AD17	GND
16	AD21	AD20	GND	AD19
17	+3.3V	AD23	AD22	+3.3V
18	IDSEL0	GND	IDSEL1	IDSEL2
19	AD24	C/BE3#	VI/O	IDSEL3
20	GND	AD26	AD25	GND
21	AD29	+5V	AD28	AD27
22	+5V	AD30	GND	AD31
23	REQ0#	GND	REQ1#	VI/O
24	GND	REQ2#	+5V	GNT0#
25	GNT1#	VI/O	GNT2#	GND
26	+5V	CLK0	GND	CLK1
27	CLK2	+5V	CLK3	GND
28	GND	INTD#	+5V	RST#
29	+12V	INTA#	INTB#	INTC#
30	-12V	REQ3#	GNT3#	GND

2.19 Audio Connector Line-IN/Line-OUT/Mic-IN/CDIN (CN6)

Pin	Signal
1	MIC
2	MIC_VREF
3	GND
4	CD_GND
5	LINEIN_L
6	CD_IN_L
7	LINEIN_R
8	CD_GND
9	GND
10	CD_IN_R
11	LINEOUT_L
12	LINEOUT_R
13	GND
14	GND

2.20 Power Connector (CN7)

Pin	Signal
1	Power IN
2	GND

2.21 SATA Power Connector (CN8)

Pin	Signal
1	+12V
2	GND
3	GND
4	+5V

2.22 10 /100 Base-TX Ethernet Connector (CN9)

Pin	Signal	Pin	Signal
1	RX-	2	RX+
3	Temp_GND	4	Temp_GND
5	Chassis_GND	6	Chassis_GND
7	Temp_GND	8	Temp_GND
9	TX+	10	TX-

2.23 2nd USB Connector (CN10)

Pin	Signal
1	+5V
2	USBD2-
3	USBD2+
4	GND
5	GND

2.24 1st USB Connector (CN11)

Pin	Signal
1	+5V
2	USBD1-
3	USBD1+
4	GND
5	GND

2.25 3rd USB Connector (CN12)

Pin	Signal
1	+5V
2	USBD3-

3	USBD3+
4	GND
5	GND

2.26 4th USB Connector (CN13)

Pin	Signal
1	+5V
2	USBD4-
3	USBD4+
4	GND
5	GND

2.27 SATA Connector (CN14)

Pin	Signal
1	GND
2	SATA_TX+
3	SATA_TX-
4	GND
5	SATA_RX-
6	SATA_RX+
7	GND

2.28 LVDS-LCD Connector (CN15)

Pin	Signal	Pin	Signal
1	ENBKL	2	BKL_CON
3	PPVCC	4	GND
5	LVDS1_TXCLK-	6	LVDS1_TXCLK+
7	PPVCC	8	GND

9	LVDS1_TX0-	10	LVDS1_TX0+
11	LVDS1_TX1-	12	LVDS1_TX1+
13	LVDS1_TX2-	14	LVDS1_TX2+
15	N.C	16	N.C
17	I2C_DATA	18	I2C_CLK
19	LVDS2_TX0-	20	LVDS2_TX0+
21	LVDS2_TX1-	22	LVDS2_TX1+
23	LVDS2_TX2-	24	LVDS2_TX2+
25	N.C	26	N.C
27	PPVCC	28	GND
29	LVDS2_TXCLK-	30	LVDS2_TXCLK+

2.29 CRT Connector (CN16)

Pin	Signal
1	VSYNC
2	HSYNC
3	CRT_PLUG#
4	DDC_SCLK
5	DDC_SDATA
6	GND
7	RED
8	GND
9	GREEN
10	GND
11	BLUE
12	GND
13	+5V

2.30 COM4 RS-232 Serial Port Connector (CN17)

Pin	Signal
1	DCD
2	DSR
3	RXD
4	RTS
5	TXD
6	CTS
7	DTR
8	RI
9	GND

2.31 COM3 RS-232 Serial Port Connector (CN18)

Pin	Signal
1	DCD
2	DSR
3	RXD
4	RTS
5	TXD
6	CTS
7	DTR
8	RI
9	GND

2.32 COM2 RS-232 Serial Port Connector (CN19)

Pin	Signal
1	DCD (422TXD-/485DATA-)

2	DSR
3	RXD (422RXD+)
4	RTS
5	TXD (422TXD+/485DATA+)
6	CTS
7	DTR (422RXD-)
8	RI2/+5V/+12V
9	GND

2.33 COM1 RS-232 Serial Port Connector (CN20)

Pin	Signal
1	DCD
2	DSR
3	RXD
4	RTS
5	TXD
6	CTS
7	DTR
8	RI
9	GND

2.34 PCI-E/104 Connector (CN21)

Bottom View Signal Assignment			
2	PE_RST#	Reserved (GPIO)	1
4	3.3V	3.3V	3
6	Reserved (HS0+)	Reserved (HS1+)	5
8	Reserved (HS0-)	Reserved (HS1-)	7
10	GND	GND	9
12	PEx1_0Tp	PEx1_1Tp	11
14	PEx1_0Tn	PEx1_1Tn	13
16	GND	GND	15
18	PEx1_3Tp	PEx1_2Tp	17
20	PEx1_3Tn	PEx1_2Tn	19
22	GND	GND	21

24	PEx1_ORp	+5 Volts	PEx1_1Rp	23
26	PEx1_ORn		PEx1_1Rn	25
28	GND		GND	27
30	PEx1_3Rp		PEx1_2Rp	29
32	PEx1_3Rn		PEx1_2Rn	31
34	GND		GND	33
36	PEx1_0Cknp		PEx1_1Cknp	35
38	PEx1_0Ckn		PEx1_1Ckn	37
40	SV Always		SV Always	39
42	PEx1_3Cknp		PEx1_2Cknp	41
44	PEx1_3Ckn		PEx1_2Ckn	43
46	PWRGOOD		CPU DIR	45
48	PEx16_x8_x4_Cknp		SMB_DAT	47
50	PEx16_x8_x4_Ckn		SMB_CLK	49
52	PSON#		SMB_ALERT	51
54	PEG_ENA#		+5 Volts	Reserved / WAKE#
56	GND	GND		55
58	PEx16_OT(0)p	PEx16_OT(8)p		57
60	PEx16_OT(0)n	PEx16_OT(8)n		59
62	GND	GND		61
64	PEx16_OT(1)p	PEx16_OT(9)p		63
66	PEx16_OT(1)n	PEx16_OT(9)n		65
68	GND	GND		67
70	PEx16_OT(2)p	PEx16_OT(10)p		69
72	PEx16_OT(2)n	PEx16_OT(10)n		71
74	GND	GND		73
76	PEx16_OT(3)p	PEx16_OT(11)p		75
78	PEx16_OT(3)n	PEx16_OT(11)n		77
80	GND	GND		79
82	PEx16_OT(4)p	PEx16_OT(12)p		81
84	PEx16_OT(4)n	PEx16_OT(12)n		83
86	GND	GND	85	
88	PEx16_OT(5)p	PEx16_OT(13)p	87	
90	PEx16_OT(5)n	PEx16_OT(13)n	89	
92	GND	GND	91	
94	PEx16_OT(6)p	PEx16_OT(14)p	93A	
96	PEx16_OT(6)n	PEx16_OT(14)n	95	
98	GND	GND	97	
100	PEx16_OT(7)p	PEx16_OT(15)p	99	
102	PEx16_OT(7)n	PEx16_OT(15)n	101	
104	GND	GND	103	
106	SDVO_CLK	+12 Volts	SDVO_DAT (PEN#)	105
108	GND		GND	107
110	PEx16_OR(0)p		PEx16_OR(8)p	109
112	PEx16_OR(0)n		PEx16_OR(8)n	111
114	GND		GND	113
116	PEx16_OR(1)p		PEx16_OR(9)p	115
118	PEx16_OR(1)n		PEx16_OR(9)n	117
120	GND		GND	119
122	PEx16_OR(2)p		PEx16_OR(10)p	121
124	PEx16_OR(2)n		PEx16_OR(10)n	123
126	GND		GND	125
128	PEx16_OR(3)p		PEx16_OR(11)p	127
130	PEx16_OR(3)n		PEx16_OR(11)n	129
132	GND		GND	131
134	PEx16_OR(4)p		PEx16_OR(12)p	133
136	PEx16_OR(4)n		PEx16_OR(12)n	135
138	GND	GND	137	
140	PEx16_OR(5)p	PEx16_OR(13)p	139	
142	PEx16_OR(5)n	PEx16_OR(13)n	141	
144	GND	GND	143	
146	PEx16_OR(6)p	PEx16_OR(14)p	145	
148	PEx16_OR(6)n	PEx16_OR(14)n	147	
150	GND	GND	149	
152	PEx16_OR(7)p	PEx16_OR(15)p	151	
154	PEx16_OR(7)n	PEx16_OR(15)n	153	
156	GND	GND	155	

Toward center of board

Toward edge of board

2.35 FAN Connector (CN22)

Pin	Signal
1	Speed Sense
2	+5V
3	Speed Control

2.36 Touch Screen Connector (CN23)

Pin	8-wire Signal	4-wire Signal	5-wire Signal
1	Ground	Ground	Ground
2	Top Excite	Top	UL(Y)
3	Bottom Excite	Bottom	UR(H)
4	Left Excite	Left	LL(L)
5	Right Excite	Right	LR(X)
6	Top Sense	N/C	SENSE
7	Bottom Sense	N/C	N/C
8	Left Sense	N/C	N/C
9	Right Sense	N/C	N/C

2.37 External RTC Connector (BAT1)

Pin	Signal
1	+RTCBAT
2	GND

Below Table for China RoHS Requirements

产品中有毒有害物质或元素名称及含量

AAEON Main Board/ Daughter Board/ Backplane

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板 及其电子组件	×	○	○	○	○	○
外部信号 连接器及线材	×	○	○	○	○	○
<p>O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下。</p> <p>X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。</p> <p>备注: 此产品所标示之环保使用期限, 系指在一般正常使用状况下。</p>						

Chapter

3

**Award
BIOS Setup**

3.1 System Test and Initialization

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors. Non-fatal error messages usually appear on the screen along with the following instructions:

Press <F1> to RESUME

Write down the message and press the F1 key to continue the boot up sequence.

System configuration verification

These routines check the current system configuration against the values stored in the CMOS memory. If they do not match, the program outputs an error message. You will then need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

1. You are starting your system for the first time
2. You have changed the hardware attached to your system
3. The CMOS memory has lost power and the configuration information has been erased.

The PFM-945C CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally runs down.

3.2 Award BIOS Setup

Awards BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS RAM so that it retains the Setup information when the power is turned off.

Entering Setup

Power on the computer and press immediately. This will allow you to enter Setup.

Standard CMOS Features

Use this menu for basic system configuration. (Date, time, IDE, etc.)

Advanced BIOS Features

Use this menu to set the advanced features available on your system.

Advanced Chipset Features

Use this menu to change the values in the chipset registers and optimize your system performance.

Integrated Peripherals

Use this menu to specify your settings for integrated peripherals. (Primary slave, secondary slave, keyboard, mouse etc.)

Power Management Setup

Use this menu to specify your settings for power management. (HDD power down, power on by ring, KB wake up, etc.)

PnP/PCI Configurations

This entry appears if your system supports PnP/PCI.

PC Health Status

This menu allows you to set the shutdown temperature for your

system.

Frequency/Voltage Control

Use this menu to specify your settings for auto detect DIMM/PCI clock and spread spectrum.

Load Fail-Safe Defaults

Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate.

Load Optimized Defaults

Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While AWARD has designated the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs.

Set Supervisor/User Password

Use this menu to set Supervisor/User Passwords.

Save and Exit Setup

Save CMOS value changes to CMOS and exit setup.

Exit Without Saving

Abandon all CMOS value changes and exit setup.

You can refer to the “AAEON BIOS Item Description.pdf” file in the CD for the meaning of each setting in this chapter.

Chapter

4

**Driver
Installation**

4.1 Software Drivers

This chapter describes the operation and installation of the display drivers supplied on the Supporting CD-ROM that are shipped with your product. The onboard VGA adapter is based on the AMD LX VGA Flat Panel/CRT controller. This controller offers a large set of extended functions and higher resolutions. The purpose of the enclosed software drivers is to take advantage of the extended features of the AMD LX VGA Flat Panel/CRT controller.

Hardware Configuration

Some of the high-resolution drivers provided in this package will work only in certain system configurations. If a driver does not display correctly, try the following:

1. Change the display controller to CRT-only mode, rather than flat panel or simultaneous display mode. Some high-resolution drivers will display correctly only in CRT mode.
2. If a high-resolution mode does not support your system, try to use a lower-resolution mode. For example, 1024 x 768 mode will not work on some systems, but 800 x 600 mode supports the most.

4.2 Necessary to Know

The instructions in this manual assume that you understand elementary concepts of MS-DOS and the IBM Personal Computer. Before you attempt to install any driver from the *Supporting CD-ROM*, you should:

- Know how to copy files from a CD-ROM to a directory on the hard disk
- Understand the MS-DOS directory structure

If you are uncertain about any of these concepts, please refer to the DOS or OS/2 user reference guides for more information before you proceed with the installation.

Before you begin

The Supporting CD-ROM contains different drivers for corresponding Windows OS, please choose the specific driver for your Windows OS.

4.3 Installation

Insert the PFM-945C CD-ROM into the CD-ROM Drive. And install the drivers from Step 1 to Step 5 in order.

Step 1 – Install INF Driver

1. Click on the **Step 1-INF Driver** folder and then double click on the **Setup.exe**
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 2 – Install VGA Driver

1. Click on the **Step 2 - VGA Driver** folder and double click on the **Setup.exe**
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 3 – Install LAN Driver

1. Double click on the **82551ER.exe**. before you key in the path where you want the unzipped files place on and then click on Unzip button.
2. Click on **Start, Settings, Control Panel** and **System** button in order.
3. Select **Device Manager** under the **Hardware** category.
4. Double click on the **Ethernet controller** and select **reinstall Driver** button under the **General** category.
5. Click **Next** twice and tick the **Specify a location** option.
6. Click **Next** and choose a route where you want place the folders on before you click on **open**.

Click **Next**, **Yes** and **Finish** button in order, and the window will show you how to finish the installation process.

Step 4 – Install Audio Driver

1. Click on the **Step 4 - Audio Driver** folder and double click on the **WDM_A400.exe**
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 5 – Install PenMount 6300 Touch Driver

4. Click on the **Step 5- PenMount 6300 Touch Driver** folder and double click on the **Setup.exe**
5. Follow the instructions that the window shows
6. The system will help you install the driver automatically

Appendix

A

Programming the Watchdog Timer

A.1 Programming

PFM-945C utilizes SCH3114-NU chipset as its watchdog timer controller.

The SCH311X WDT (Watch Dog Timer) has a programmable time-out ranging from 1 to 255 minutes with one minute resolution, or 1 to 255 second resolution. The unit of the WDT timeout value are selected via bit[7] of the WDT_TIMEOUT register. The WDT time-out value is set through the WDT_VAL Runtime register.

Setting The WDT_VAL register to 0x00 disables the WDT function (this is its power on default).

Setting the WDT_VAL to any other non-zero value will cause the WDT to reload and begin counting down from the value loaded.

When the WDT count value reaches zero the counter stops and sets the Watchdog time-out status bit in the WDT_CTRL Runtime register. Note: Regardless of the current state of the WDT, the WDT time-out status bit can be directly set or cleared by the Host CPU.

The related register for configuring WDT is list as follows:

NAME	REG OFFSET (HEX)	DESCRIPTION
GP60 Default = 0x01 on VTR POR	47 (R/W)	General Purpose I/O bit 6.0 Bit[0] In/Out : =1 Input, =0 Output Bit[1] Polarity : =1 Invert, =0 No Invert Bit[3:2] Alternate Function Select 11=VDT 10=Either Edge Triggered Interrupt Input 4 (Note 26.20) 01=LED1 00=GPIO Bits[6-4] Reserved Bit[7] Output Type Select 1=Open Drain 0=Push Pull

WDT_TIME_OUT Default = 0x00 on VCC POR, VTR POR, and PCI Reset	65 (R/W)	Watch-dog Timeout Bit[0] Reserved Bit[1] Reserved Bits[6:2] Reserved, = 00000 Bit[7] WDT Time-out Value Units Select = 0 Minutes (default) = 1 Seconds
WDT_VAL Default = 0x00 on VCC POR, VTR POR, and PCI Reset	66 (R/W)	Watch-dog Timer Time-out Value Binary coded, units = minutes (default) or seconds, selectable via Bit[7] of WDT_TIME_OUT register (0x52). 0x00 Time out disabled 0x01 Time-out = 1 minute (second) 0xFF Time-out = 255 minutes (seconds)

NAME	REG OFFSET (HEX)	DESCRIPTION
WDT_CFG Default = 0x00 on VCC POR, VTR POR, and PCI Reset	67 (R/W)	Watch-dog timer Configuration Bit[0] Reserved Bit[1] Keyboard Enable =1 WDT is reset upon a Keyboard interrupt. =0 WDT is not affected by Keyboard interrupts. Bit[2] Mouse Enable =1 WDT is reset upon a Mouse interrupt. =0 WDT is not affected by Mouse interrupts. Bit[3] Reserved Bits[7:4] WDT Interrupt Mapping 1111 = IRQ15 0011 = IRQ3 0010 = IRQ2 (Note) 0001 = IRQ1 0000 = Disable Note: IRQ2 is used for generating SMI events via the serial IRQ's stream. The WDT should not be configured for IRQ2 if the IRQ2 slot is enabled for generating an SMI event.
WDT_CTRL Default = 0x00 on VCC POR and VTR POR Default = 0000000xb on PCI Reset Note: Bit[0] is not cleared by PCI Reset	68 (R/W) Bit[2] is Write-Only	Watch-dog timer Control Bit[0] Watch-dog Status Bit, R/W =1 WD timeout occurred =0 WD timer counting Bit[1] Reserved Bit[2] Force Timeout, W =1 Forces WD timeout event; this bit is self-clearing Bit[3] P20 Force Timeout Enable, R/W = 1 Allows rising edge of P20, from the Keyboard Controller, to force the WD timeout event. A WD timeout event may still be forced by setting the Force Timeout Bit, bit 2. Note: If the P20 signal is high when the enable bit is set a WD timeout event will be generated. = 0 P20 activity does not generate the WD timeout event. Note: The P20 signal will remain high for a minimum of 1us and can remain high indefinitely. Therefore, when P20 forced timeouts are enabled, a self- clearing edge-detect circuit is used to generate a signal which is OR'ed with the signal generated by the Force Timeout Bit. Bit[7:4] Reserved. Set to 0

The following is a sample code to set WDT for 3 seconds.

```
;Runtime register I/O base address
SUPERIO_GPIO_PORT    EQU    800h
.MODEL    SMALL
.CODE

begin:
    ;enable WDT
        mov dx, SUPERIO_GPIO_PORT + 47h
        mov al, 0Ch
        out dx, al
    ;WDT_TIME_OUT register
        mov dx, SUPERIO_GPIO_PORT + 65h
        mov al, 80h                ;unit is second
        out dx, al
    ;WDT_VAL register
        mov dx, SUPERIO_GPIO_PORT + 66h
        mov al, 03h                ;3 seconds
        out dx, al
    ;exit
        mov ah,4ch
        int 21h

    END begin
```

Appendix

B

I/O Information

B.1 I/O Address Map

		Input/output (IO)
		[00000000 - 00000CF7] PCI bus
		[00000D00 - 0000FFFF] PCI bus

B.2 1st MB Memory Address Map

		Memory
		[00000000 - 0009FFFF] System board
		[000A0000 - 000BFFFF] PCI bus
		[000C0000 - 000DFFFF] PCI bus
		[000E0000 - 000EFFFF] System board
		[000F0000 - 000FFFFF] System board
		[00100000 - 3F6DFFFF] System board
		[3F6E0000 - 3F6FFFFF] System board
		[3F700000 - FEBFFFFF] PCI bus
		[FEC00000 - FEC00FFF] System board
		[FED13000 - FED1DFFF] System board
		[FED20000 - FED8FFFF] System board
		[FEE00000 - FEE00FFF] System board
		[FFB00000 - FFB7FFFF] System board
		[FFB80000 - FFBFFFFF] Intel(R) 82802 Firmware Hub Device
		[FFF00000 - FFFFFFFF] System board

B.3 IRQ Mapping Chart

Bus Type	Device	IRQ
ISA	System timer	0
ISA	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard	1
ISA	Communications Port (COM2)	3
ISA	Communications Port (COM1)	4
ISA	System CMOS/real time clock	8
ISA	Microsoft ACPI-Compliant System	9
ISA	Communications Port (COM3)	10
ISA	Communications Port (COM4)	11
ISA	Numeric data processor	13
ISA	Primary IDE Channel	14
PCI	Intel(R) 82801G (ICH7 Family) SMBus Controller - 27DA	15
PCI	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CB	16
PCI	Mobile Intel(R) 945 Express Chipset Family	16
PCI	VIA Rev 5 or later USB Universal Host Controller	16
PCI	Realtek AC'97 Audio	17
PCI	VIA Rev 5 or later USB Universal Host Controller	17
PCI	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CA	18
PCI	VIA USB Enhanced Host Controller	18
PCI	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C9	19
PCI	Intel(R) 82801GBM/GHM (ICH7-M Family) Serial ATA Storage Controller - 27C4	19
PCI	Intel(R) 825xER PCI Adapter	20
PCI	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C8	23
PCI	Intel(R) 82801G (ICH7 Family) USB2 Enhanced Host Controller - 27CC	23

B.4 DMA Channel Assignments

AAEON	Direct memory access (DMA)	2	Standard floppy disk controller
		4	Direct memory access controller
	Input/output (IO)		
	Interrupt request (IRQ)		
	Memory		

Appendix

C

Mating Connector

C.1 List of Mating Connectors and Cables

The table notes mating connectors and available cables.

Connect or Label	Function	Mating Connector		Availabl e Cable	Cable P/N
		Vendor	Model no		
CN1	Front Panel Connector- 1	Molex	1.25mm Pitch 10 Pins (Molex 51021-1000)	Front Panel Cable	1701010150
CN2	Front Panel Connector- 2	Molex	1.25mm Pitch 8 Pins (Molex 51021-0800)	Front Panel Cable	1701080150
CN3	PS2 Keyboard / Mouse Connector	Molex	1.25mm Pitch 6 Pins (Molex 51021-0600)	PS2 KB/MS Cable	1700060155
CN4	LCD Inverter Connector	Molex	1.5mm Pitch 5 Pins (Molex ZHR-5)	Inverter Cable	1705050153
CN5	PCI/104 Connector	N/A	N/A	N/A	N/A
CN6	Audio Connector	Molex	1.25mm Pitch 14 Pins (Molex 51021-1400)	Audio Cable	1709140303
CN7	Power Connector	N/A	N/A	Power Cable	1702002010

CN8	SATA Power Connector	Molex	2.0mm Pitch 4 Pins (Molex 87369-040X)	SATA Power Cable	1702150121
CN9	10 /100 Base-Tx Ethernet Connector	Molex	2.0mm Pitch 8 Pins (Molex 51353-0801)	LAN Cable	1700100200
CN10	2nd USB Connector	Molex	1.25mm Pitch 5 Pins (Molex 51021-0500)	USB Cable	1700050207
CN11	1st USB Connector	Molex	1.25mm Pitch 5 Pins (Molex 51021-0500)	USB Cable	1700050207
CN12	3rd USB Connector	Molex	1.25mm Pitch 5 Pins (Molex 51021-0500)	USB Cable	1700050207
CN13	4th USB Connector	Molex	1.25mm Pitch 5 Pins (Molex 51021-0500)	USB Cable	1700050207
CN14	SATA Signal Connector	Molex	1.27mm Pitch 7 Pins (Molex 67582-0000)	SATA Signal Cable	1709070200
CN15	LVDS-LCD Connector	HIROSE	1.25mm Pitch 30 Pins DF13-30DS-1.25C	N/A	N/A
CN16	CRT Connector	Molex	1.25mm Pitch 13 Pins (Molex 51021-1300)	CRT Cable	1709150151
CN17	COM4 RS-232	Molex	1.25mm Pitch 9 Pins (Molex 51021-0900)	Serial Port	1701090150

	Serial Port Connector			Cable	
CN18	COM3 RS-232 Serial Port Connector	Molex	1.25mm Pitch 9 Pins (Molex 51021-0900)	Serial Port Cable	1701090150
CN19	COM2 RS-232/422 /485 Serial Port Connector	Molex	1.25mm Pitch 9 Pins (Molex 51021-0900)	Serial Port Cable	1701090150
CN20	COM1 RS-232 Serial Port Connector	Molex	1.25mm Pitch 9 Pins (Molex 51021-0900)	Serial Port Cable	1701090150
CN21	PCIe/104 Connector	Samtec	0.64mm Pitch 78 Pins (Samtec. ASP-129637-03)	N/A	N/A
CN22	FAN Connector	Molex	2.0mm Pitch 3 Pins (Molex 87369-030X)	N/A	N/A
CN23	Touch screen Connector	JST	1.0mm Pitch 9 Pins (JST SHR-09V-S-B)	N/A	N/A

PCI/104-Express**PFM - 945 C**

CFD1	Compact Flash Slot	N/A	N/A	N/A	N/A
BAT1	External RTC Connector	Molex	1.25mm Pitch 2 Pins (Molex 51021-0200)	Battery Cable	175011901C