

PFM-F620S

Intel® ULV Celeron®

400 / 650 MHz Processor

PC/104 CPU Module

With LCD, Ethernet,

COM, USB Ports

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Packing List

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

- 1 PFM-620S CPU Card
- Cable Kit (IDE, Serial Port x 2, RS-422/485, Parallel Port, Keyboard/Mouse, VGA, RJ-45 Conversion Cable, USB Cable, Power Cable)
- 1 Quick Installation Guide
- 1 CD-ROM for manual (in PDF format) and drivers

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

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Chapter

1

General Information

1.1 Introduction

The PFM-620S has the highest processor performance level among AAEON's current PC/104 CPU Modules. It supports onboard Intel® Ultra Low Voltage Celeron® 400/650MHz processors and delivers excellent performance with low power consumption.

More options for your extension

The PFM-620S offers a PC/104+ expansion bus, which has excellent ability for expansion to fulfill your application needs. The PC/104+ expansion bus can work with add-on devices such as Gigabit LAN, USB 2.0 or IEEE 1394.

Marvelous Graphic Accelerator

The VIA VT8606 built-in 2D / 3D Graphics Accelerator offers a high-resolution display quality and supports 18/36 bit TTL TFT LCD displays. The VIA VT82C686B is a superior chipset with many integrated features such as Audio (via daughter board), USB, Serial port, Parallel port and etc. This provides excellent functionality for almost any purpose.

High performance and Low power consumption

Overall, the PFM-620S provides an operating environment with low power consumption and multifunctionality. The compact size and flexible expansion interface makes this module the best choice for embedded applications which have limited space and an industrial environment.

1.2 Features

- Onboard Intel® Ultra Low Voltage Celeron® Processor
- Up to 36-bit TTL TFT LCD
- 10/100Mbps Fast Ethernet
- Supports Type I CompactFlash™ Memory
- 2 COMs / 2 USB Ports
- +5V Only Operation

1.3 Specifications

System

- CPU: Onboard Intel® Ultra Low Voltage Celeron® 400/650MHz Processor
- Memory: 144-pin SDRAM SODIMM x 1, Max. 512MB (PC-100/133)
- Chipset: VIA VT8606 / VT82C686B
- BIOS: AWARD 256KB FLASH ROM
- Ethernet: Realtek RTL8100BL, 10/100Base-TX RJ-45 connector x 1
- Watchdog Timer: Generates a time-out system reset
- H/W Status Monitoring: Supports power supply voltage and temperature monitoring.
- SSD: Type I CompactFlash™ Slot x 1
- Expansion Interface: PC/104+, PC/104 for Fanless Model
- Battery: Lithium battery
- Power Requirement: +5V, AT
- Board Size: 4.53"(L) x 3.78"(W) (115mm x 96mm)
- Gross Weight: 0.66lb(0.3kg)
- Operating Temperature: 32 ~140 (0 ~60)
32 ~122 (0 ~50) for Fanless Model

Display

- Chipset VIA VT8606
- Memory size: Shared system memory up to 32 MB
- Resolutions: Up to 1280 x 1024 @ 24bpp colors for CRT
Up to 1024 x 768 @ 18bpp colors for LCD
- LCD Interface: 18/36-bit TTL TFT LCD

I/O

- MIO: EIDE (UDMA33) x 1, Keyboard + Mouse x 1, RS-232 x 1, RS-232/422/485 x 1 (+5V output option on RI signal), Parallel x 1
- IrDA: One IrDA Tx/Rx header
- Audio: MIC-in, Line-in, Line-out (optional Audio Decoder Daughter Board required)
- USB: One 5x2 pin header supports 2 USB 1.1 ports

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!

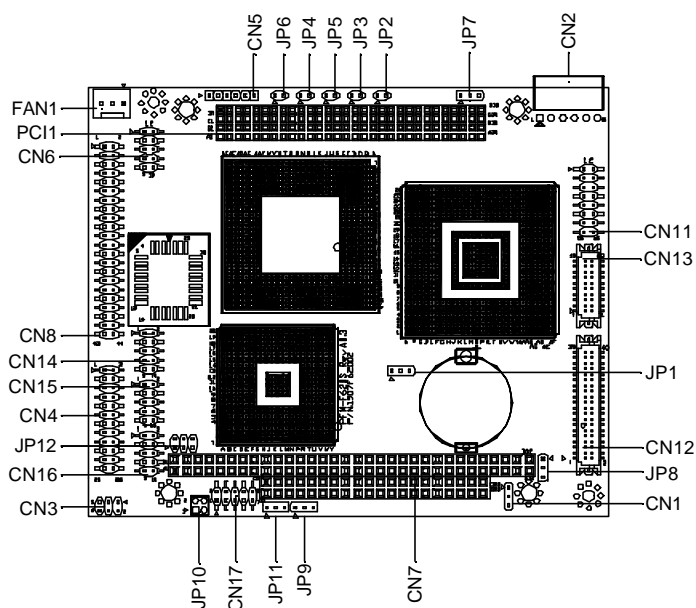
Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.

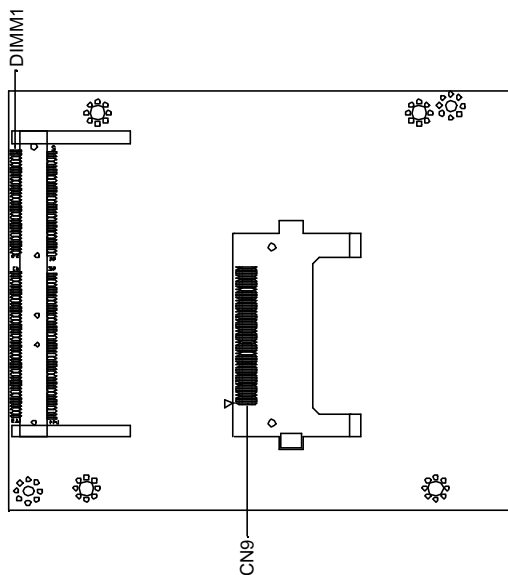
Caution!

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

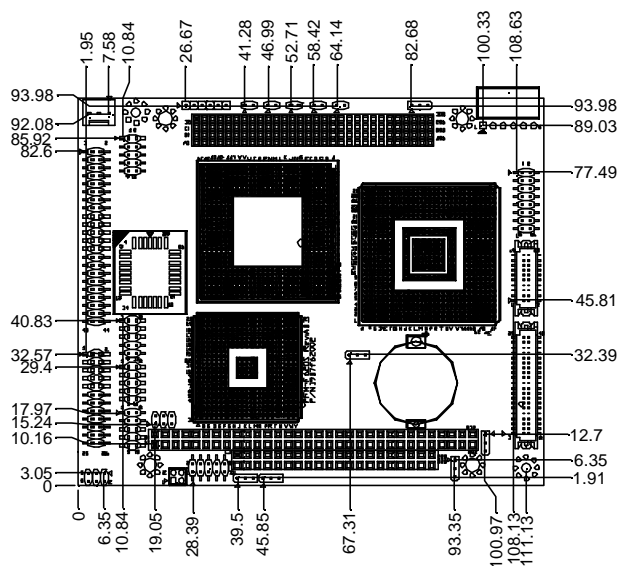
Component Side



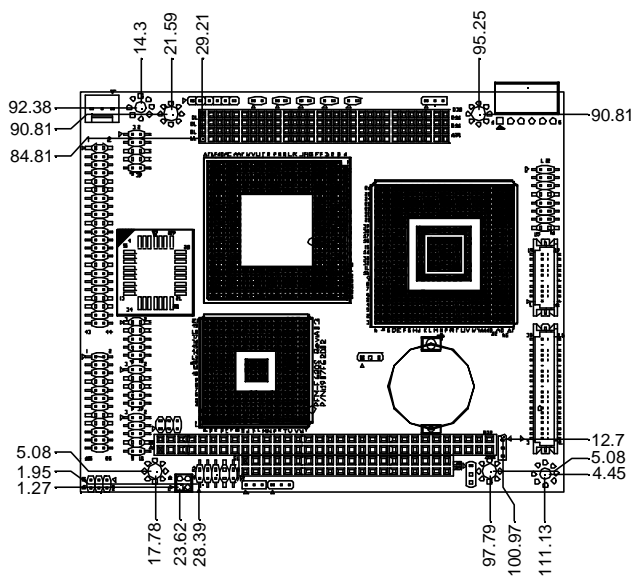
Solder Side

2.3 Mechanical Drawing

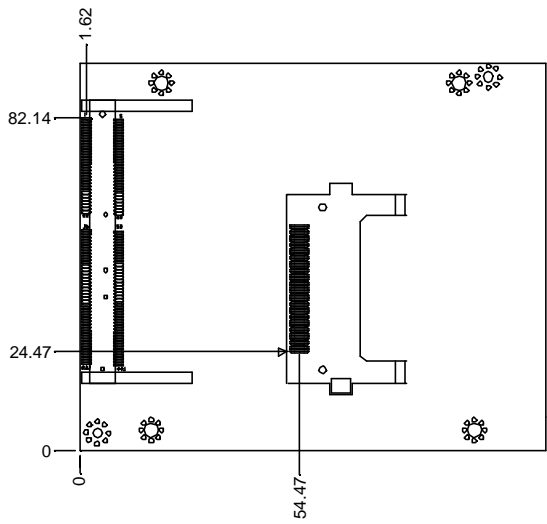
Component Side - 1



Component Side - 2



Solder Side



2.4 List of Jumpers

There are a number of jumpers in the board that allow you to configure your system to suit your application.

The table below shows the function of each jumper in the board:

Jumpers

Label	Function
JP1	Clear CMOS
JP7	PCI-104 VIO power Selection
JP8	LCD Panel Clock Selection
JP9	COM1 RI and +5V Selection
JP11	COM2 RI and +5V Selection
JP12	RS-232/422/485 Selection

2.5 List of Connectors

There are a number of connectors in the board that allow you to configure your system to suit your application. The table below shows the function of each connector in the board:

Connectors

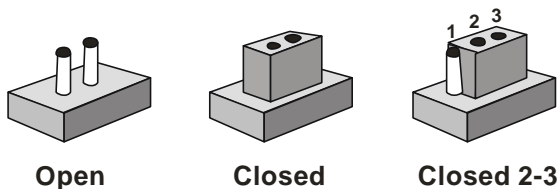
Label	Function
CN1	Extended –12V and –5V power
CN2	Power Connector
CN3	KB/MS Connector
CN4	Parallel Port Connector
CN5	IR Connector (DF-13 20 x 2)
CN6	10/100Base Ethernet Connector
CN7	PC 104 Connector
CN8	IDE Connector
CN9	CompactFlash ⁷ Slot
CN11	VGA Connector
CN12&CN13	LCD Panel Connector
CN14	USB Connector
CN15	COM1 Port Connector
CN16	COM2 Port Connector
CN17	AC97 Connector
JP2	HDD LED
JP3	RESET SWITCH

JP4	SPEAKER
JP5	POWER LED
JP6	LAN LINK LED
JP10	Support 422,485 connector
PCI1	PCI-104 Plus Connector
FAN1	CPU Fan Connector
DIMM1	SODIMM Socket

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.



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 Extended -12V and -5V (CN1)

Pin	Signal
1	-12V
2	-5V
3	GND

2.8 Power Connector (CN2)

Pin	Signal
1	+5V
2	GND
3	GND
4	+12V
5	+5V
6	+5V

2.9 KB/Mouse Connector (CN3)

Pin	Signal	Pin	Signal
1	KB_DATA	2	KB_CLK
3	GND	4	+5V
5	MS_DATA	6	MS_CLK

2.10 Parallel Port Connector (CN4)

Pin	Signal	Pin	Signal
1	STROBE	2	AFD
3	PTD0	4	ERROR
5	PTD1	6	INIT
7	PTD2	8	SLIN
9	PTD3	10	GND
11	PTD4	12	GND
13	PTD5	14	GND
15	PTD6	16	GND
17	PTD7	18	GND
19	ACK	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SELECT	26	NC

2.11 IR Connector (CN5)

Pin	Signal
1	+5V
2	NC
3	IRRX
4	GND
5	IRTX

2.12 10/100Base Ethernet Connector (CN6)

Pin	Signal	Pin	Signal
1	RX-1	2	RX+1
3	C GND	4	C GND
5	LAN_GND	6	LAN_GND
7	C GND	8	C GND
9	TX+1	10	TX-1

2.13 IDE Connector (CN8)

Pin	Signal	Pin	Signal
1	IDE RESET	2	GND
3	DATA7	4	DATA8
5	DATA6	6	DATA9
7	DATA5	8	DATA10
9	DATA4	10	DATA11
11	DATA3	12	DATA12
13	DATA2	14	DATA13
15	DATA1	16	DATA14
17	DATA0	18	DATA15
19	GND	20	N.C
21	REQ	22	GND
23	IO WRITE	24	GND
25	IO READ	26	GND
27	IO READY	28	GND
29	DACK	30	GND
31	IRQ	32	N.C
33	ADDR1	34	UDMA DETECT

35	ADDR0	36	ADDR2
37	CS#1	38	CS#3
39	IDE_LED	40	GND
41	+5V	42	+5V
43	GND	44	N.C

2.14 CompactFlash™ (CN9)

Pin	Signal	Pin	Signal
1	GND	26	GND
2	SDD3	27	SDD11
3	SDD4	28	SDD12
4	SDD5	29	SDD13
5	SDD6	30	SDD14
6	SDD7	31	SDD15
7	SDCS#1	32	SDCS#3
8	GND	33	GND
9	GND	34	SDIOR#
10	GND	35	SDIOW#
11	GND	36	+5V
12	GND	37	IRQ15
13	+5V	38	+5V
14	GND	39	CSEL#
15	GND	40	N/C
16	GND	41	SEC_IDERST#
17	GND	42	SIORDY
18	SDA2	43	SDREQ
19	SDA1	44	SDACK#
20	SDA0	45	DASP#

PC/104 Module	P F M - 6 2 0 S
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21	SDD0	46	PDIAG#
22	SDD1	47	SDD8
23	SDD2	48	SDD9
24	N/C	49	SDD10
25	GND	50	GND

2.15 VGA Connector (CN11)

Pin	Signal	Pin	Signal
1	RED	2	+5V
3	GREEN	4	GND
5	BLUE	6	N.C.
7	N.C.	8	DDCSDA
9	GND	10	HSYNC
11	GND	12	VSYNC
13	GND	14	DDCSCL
15	GND	16	N.C.

2.16 LCD Panel Connector (CN12, CN13)

CN12

Pin	Signal	Pin	Signal
1	+5V	2	+5V
3	GND	4	GND
5	+3.3V	6	+3.3V
7	ENVDD	8	GND
9	N/A	10	N/A
11	B0	12	B1

13	B2	14	B3
15	B4	16	B5
17	N/A	18	N/A
19	G0	20	G1
21	G2	22	G3
23	G4	24	G5
25	N/A	26	N/A
27	R0	28	R1
29	R2	30	R3
31	R4	32	R5
33	GND	34	GND
35	Dot Clock	36	FLM (VSYNC)
37	DE	38	LP (HSYNC)
39	N/A	40	ENABKL

CN13

Pin	Signal	Pin	Signal
1	GND	2	GND
3	B10	4	B11
5	B12	6	B13
7	B14	8	B15
9	G10	10	G11
11	G12	12	G13
13	G14	14	G15
15	R10	16	R11
17	R12	18	R13
19	R14	20	R15

2.17 USB Connector (CN14)

Pin	Signal	Pin	Signal
1	+5V	2	GND
3	USBD0-	4	GND
5	USBD0+	6	USBD1+
7	GND	8	USBD1-
9	GND	10	+5V

2.18 COM1 Port Connector (CN15)

Pin	Signal	Pin	Signal
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI(+5V)	10	NC

2.19 COM2 Port Connector (CN16)

Pin	Signal	Pin	Signal
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI(+5V)	10	NC

2.20 AC97 Connector (CN17)

Pin	Signal	Pin	Signal
1	AC_RST#	2	AC_SYNC
3	SDIN	4	SDOUT
5	GND	6	BITCLK
7	GND	8	+5V
9	N.C	10	+3.3V

2.21 HDD LED Connector (JP2)

Pin	Signal	Pin	Signal
1	+5V	2	HDD LED

2.22 Reset Switch (JP3)

Pin	Signal	Pin	Signal
1	RSTIN#	2	GND

2.23 Speaker (JP4)

Pin	Signal	Pin	Signal
1	+5V	2	BEEPR

2.24 Power LED (JP5)

Pin	Signal	Pin	Signal
1	+5V	2	GND

2.25 LAN Link LED (JP6)

Pin	Signal	Pin	Signal
1	+3.3V	2	LINK_LED

2.26 RS-422, 485 Connector (JP10)

Pin	Signal	Pin	Signal
1	422RXD+	2	422RXD-
3	422TXD+/485D+	4	422TXD-/485D-

2.27 CPU FAN Connector (FAN1)

Pin	Signal
1	CPU FAN
2	+5V
3	GND

2.28 Clear CMOS (JP1)

JP1	Function
1-2	Normal (Default)
2-3	Clear CMOS

2.29 PCI-104 VIO Power Selection (JP7)

JP7	Function
1-2	+5V (Default)
2-3	+3.3V

2.30 LCD Panel Clock Selection (JP8)

JP8	Function
1-2	LCD Panel Clock normal
2-3	LCD Panel Clock invert (Default)

2.31 COM1 RI and +5V Selection (JP9)

JP9	Function
1-2	+5V
2-3	RI (Default)

2.32 COM2 RI and +5V Selection (JP11)

JP11	Function
1-2	+5V
2-3	RI (Default)

2.33 RS-232/422/485 Selection (JP12)

JP12	Function
1-2	RS-232 (Default)
3-4	RS-422
5-6	RS-485

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-620S 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 etc.)

PnP/PCI Configurations

This entry appears if your system supports PnP/PCI.

PC Health Status

This menu shows you the status of PC.

Frequency/Voltage Control

This menu shows you the display of frequency/Voltage Control.

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.

3.3 Standard CMOS Features

This standard Setup Menu allows users to configure system components such as date, time, hard disk drive, floppy drive and display. Once a field is highlighted, on-line help information is displayed in the right box of the Menu screen.

3.4 Advanced BIOS Features

This sample screen contains the manufacturer's default values for the PFM-620S.

3.5 Advanced Chipset Features

This sample screen contains the manufacturer's default values for the PFM-620S.

3.6 Integrated Peripherals

This sample screen contains the manufacturer's default values for the PFM-620S.

3.7 Power management Setup

This sample screen contains the manufacturer's default values for the PFM-620S.

3.8 PnP/PCI configuration

This sample screen contains the manufacturer's default values for the PFM-620S.

3.9 PC Health Status

This sample screen contains the manufacturer's default values for the PFM-620S.

3.10 Frequency/Voltage control

This sample screen contains the manufacturer's default values for the PFM-620S.

3.11 Load Fail-Safe Defaults

When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Fail-Safe Default (Y/N)?

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

3.12 Load Optimized Defaults

When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Optimized Defaults (Y/N)?

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

3.13 Set Supervisor/User Password

You can set either SUPERVISOR or USER PASSWORD, or both of them. The difference between the two is that the supervisor password allows unrestricted access to enter and change the options of the setup menus, while the user password only allows entry to the program, but not modify options.

To abort the process at any time, press Esc.

In the Security Option item in the BIOS Features Setup screen, select System or Setup:

System Enter a password each time the system boots and whenever you enter Setup.

Setup Enter a password whenever you enter Setup.

NOTE: To clear the password, simply press Enter when asked to enter a password. Then the password function is disabled.

3.14 Save & Exit Setup

If you select this option and press <Enter>, the values entered in the setup utilities will be recorded in the chipset's CMOS memory. The microprocessor will check this every time you turn on your system and compare this to what it finds as it checks the system. This record is required for the system to operate.

3.15 Exit without saving

Selecting this option and pressing <Enter> allows you to exit the Setup program without recording any new value or changing old one.

For more detailed information, 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

The PFM-620S comes with a CD-ROM that contains all drivers and utilities that you need for setup the system.

Follow the sequence below to install the drivers:

Step 1 – Install VIA 4 in 1 Driver

Step 2 – Install Graphic Driver

Step 3 – Install Audio Driver

Step 4 – Install Ethernet Driver

Please read instructions below for further detailed installations.

Insert the PFM-620S CD-ROM into the CD-ROM Drive. And install the drivers from Step 1 to Step 4 in order.

4.1 Step 1 – Install VIA 4 in 1 for Windows 98SE/2000/XP

1. Double click on the “.exe” file.
2. Follow the instructions that the window will show you.
3. The system will help you install the driver automatically.

4.2 Step 2 – Install Graphic Driver for Windows 98SE/2000/XP

1. Choose the folder according to the OS you used and then double click on the “**Setup.exe**” file.
2. Follow the instructions that the window will show you.
3. The system will help you install the driver automatically.
4. Please re-start your computer.

4.3 Step 3 – Install Audio Driver for Windows 98SE /2000/XP

1. Double click on the “**Setup.exe**” file.
2. Follow the instructions that the window will show you.
3. The system will help you install the driver automatically.
4. Please re-start your computer.

4.4 Step 4 – Install Ethernet Driver for Windows 98SE /2000/XP

1. Double click on the ***“Setup.exe”*** file.
2. Follow the instructions that the window will show you.
3. The system will help you install the driver automatically.

Appendix

A

Programming the Watchdog Timer

A.1 Programming

An onboard watchdog timer reduces the chance of disruptions which CPLD (Compact Programmable Logical Device) interface can cause. This is an invaluable protective device for standalone or punmanned applications. When the watchdog timer activates (CPU processing has come to a halt), it can reset the system, or generate an interrupt on IRQ10, IRQ11, IRQ15, and NM1. This can be set via I/O Port 444, the function as following:

- 0: RESET
- 1: NM1
- 2: IRQ10
- 3: IRQ11
- 4: IRQ15

If you decide to program the watchdog timer, you must write data to I/O port 443 (hex). The output data is a value timer. You can write form 01 (hex) to FF (hex) while simultaneously setting it. When you want to disable the watchdog timer, your program should read a Hex value from I/O port 80 (hex).

The following procesude is a sample program for the watchdog timer:

- Type C:\DOS\Debug <ENTER>
- To start watchdog timer and set function "Reset" type;
o 444 0<Enter>; out 444h data 0
- To input Watchdog timers time-out interval of 5 seconds type;
o 443 05<Enter>; out 443h data 05
- To disable the watch timer type; i80 <Enter>

The time interval data of the watchdog timer is shown in binary code (8 bits).

Sample 2: 5 seconds

0	0	0	0	0	1	0	1
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Appendix

B

I/O Information

B.1 I/O Address Map

Address	Description	User Address
000-01F	DMA Controller #1	000-000F
020-03F	Interrupt Controller #1, Master	020-021
040-05F	System Time	040-043
060-06F	8042 (Keyboard Controller)	060-064
070-07F	Real time Clock, NMI (non-maskable Interrupt) Mask	070-073
080-09F	DMA Page Register	080-08F
0A0-0BF	Interrupt Controller #2	0A0-0A1
0C0-0DF	DMA Controller #2	0C0-0DF
0F0-0FF	Math Coprpcessor	0F0-0FF
170-177	Secondary IDE Channel	170-177
1F0-1F7	Primary IDE Channel	1F0-1F7
2F8-2FF	Serial Port 2	2F8-2FF
378-37F	Parallel Printer Port 1	378-37F
3B0-3DF	EGA / VGA card	3B0-3DF
3F8-3FF	Serial Port 1	3F8-3FF

B.2 1st MB Memory Address Map

Memory Address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
C0000-CBFFF	VGA BIOS
E0000-FFFFF	System BIOS

B.3 IRQ Mapping Chart

IRQ0	System Timer	IRQ8	System CMOS / Real time clock
IRQ1	Keyboard	IRQ9	Unused
IRQ2	Cascade to IRQ Controller	IRQ10	Unused
IRQ3	COM2	IRQ11	Unused
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	Unused	IRQ13	FPU
IRQ6	Unused	IRQ14	Primary IDE
IRQ7	Printer	IRQ15	Secondary IDE

B.4 DMA Channel Assignments

DMA Channel	Function
0	Available
1	Available
2	Unused
3	Available
4	Direct Memory Access Controller
5	Available
6	Available
7	Available