PFM-535I

All In One NS Geode GX1 with
SVGA/ LCD/ Ethernet Interface
PC/104 CPU Module

PFM-535I Manual 2nd Ed.
Jun. 2005

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Packing List

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

- 1 PFM-535I PC/104 CPU Module
- 1 Quick Installation Guide
- 1 CD-ROM for manual (in PDF format), and utility
- 1 2.5" IDE flat cable, 44-pin to 44-pin
- 1 PS/2 keyboard & mouse cable
- 2 serial port cables
- 1 parallel cable
- 1 FDD flat cable
- 1 VGA flat cable
- 1 LAN cable
- 1 USB cable
- 1 Jumper kit
- 1 Short-Copper and Support kit

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-535I is the ultimate cost-effective solution for limited space applications. It is a new NS Geode PC/104 CPU Model with enhanced graphic function. It uses a NS CS5530A chipset which supports TFT LCDs. It offers all the functions of AT-compatible industrial computers on a single board. The PFM-535I comes with an embedded high-performance GX1-300 processor onboard. For maximum performance, the PFM-535I Series also supports an SDRAM SODIMM socket that can accept up to 512 MB memory.

Onboard features include an Ethernet interface, socket for Compact Flash Card, Enhanced IDE interface with up to Ultra DMA 33 transfer protocol, one parallel port, two serial ports (RS-232 and RS-232/422/485) and a PS/2 keyboard/mouse interface. A SVGA/LCD display controller (LCD, and CRT displays) allows LCD screen resolutions up to 1024 x 768 and CRT resolutions up to 1280x 1024.

The PFM-535I complies with the "Green Function" standard and supports three types of power saving features: Normal, Doze, and Sleep modes.

The display type configuration is done through the software. A single Flash chip holds the system BIOS and the VGA BIOS. This minimizes the chip usage and simplifies configuration. You can change the display BIOS simply by programming the Flash chip.

If you need additional functions, the PFM-535I has a PC/104 connector for future upgrades.

1.2 Features

- Onboard Low Power NS Geode GX1 300MHz CPU
- Support 18-bit TFT Panels
- Onboard 10/100Base-T Fast Ethernet
- Supports CompactFlash^{TM} Memory
- Supports Up to 512 MB SDRAM
- Simple and Reliable Fanless Operation

1.3 Specifications

System

- CPU — NS Geode GX1-300 MHz (low-power) processor
- System Memory — SDRAM SODIMM x 1, up to 512MB
- Chipset — NC CS5530A
- I/O Chipset — Windbond W83977F. Full 16-bit I/O decoded
- BIOS — Award 256KB Flash BIOS
- Ethernet — Realtek RTL8139DL, 10/100Base-T RJ-45 connector x 1
- SSD — CompactFlash™ socket
- Watchdog Timer — Can generate a system reset. (15sec ~ 127min15sec, 30sec/step)
- Expansion Interface — PC/104 connector x 1
- Battery — Lithium battery
- DMA — 7 DMA channels (8237 equivalent)
- Interrupt — 15 interrupt levels (8259 equivalent)
- Power Supply — Voltage +5V (4.75V to 5.25V)
- Size — 3.55" (L) x 3.775"(W) (90 mm x 96 mm)
- Gross Weight — 0.6lb (0.25 Kg)
- Operating Temperature: 32°F to 140°F (0°C to 60°C); -13°F to 176°F (-25°C to 80°C) (Optional)

I/O

- MIO : IDE x 1, FDD x 1, Keyboard x 1, Mouse x 1, RS-232 x 2, Parallel x 1
- IrDA : IrDA header x 1
- USB: 2 USB Ports

Display

- Chipset: NS CS5530A LCD/CRT controller
- Memory Size: Shared memory up to 4MB
- Resolution: 1024 x 768@16bpp (CRT), 1024 x 768 @18bpp (TFT LCD)
- LCD Interface: Up to 18-bit TFT LCD panel

Chapter

2

Quick Installation Guide

Notice:
The Quick Installation Guide is consisted in Chapter 2 of
user manual. For other chapters and further installation
instructions please refer to the user manual CD-ROM
that come 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 sensitive electronic components can be damaged by a sudden rush of power.

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

Locating connectors and jumpers (component side)
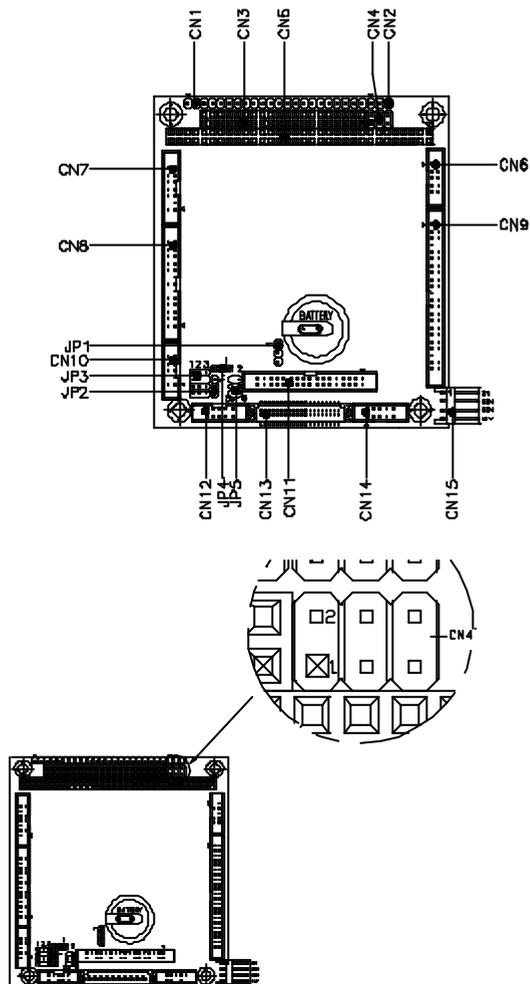
Locating connectors and jumpers (soldering side)

CN16

DIMM1
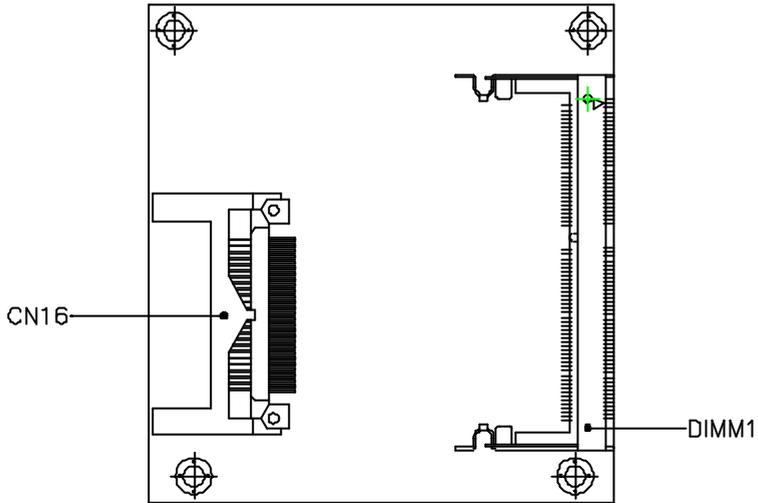
2.3 Mechanical Drawing

Mechanical drawing (component side)
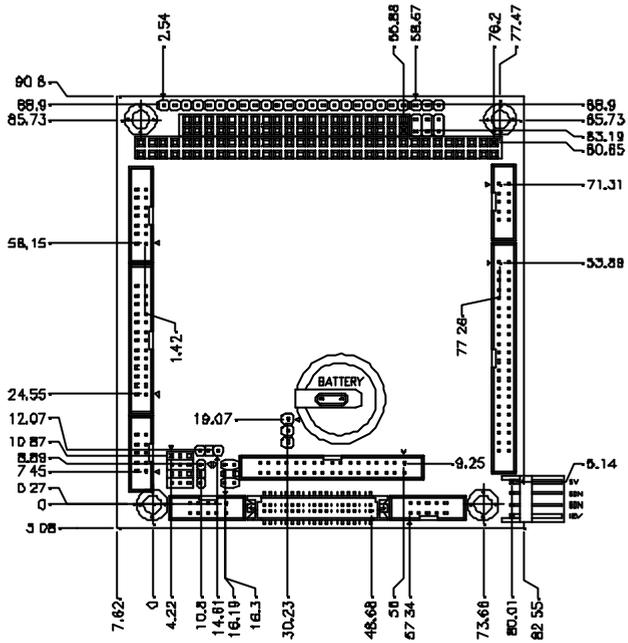
Mechanical drawing (soldering side)
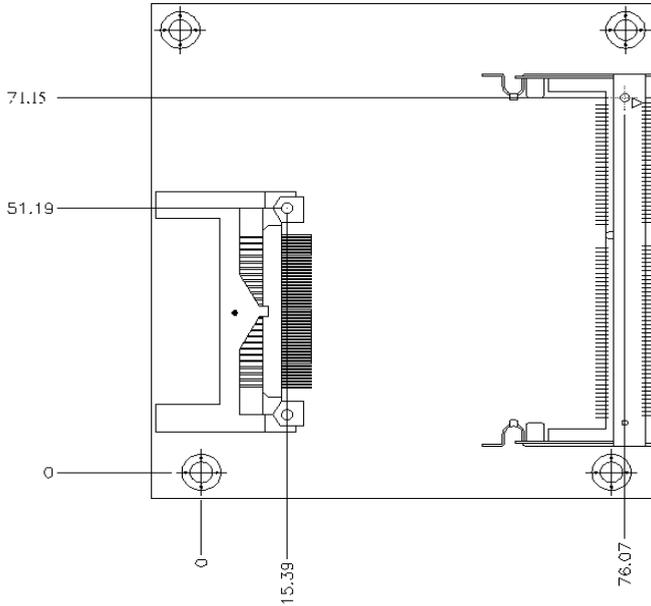
2.4 List of Jumpers

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 jumper:

Jumpers

Label	Function
JP1	Clear CMOS
JP2	LCD Clock Selection
JP3	COM2 RS-232/422/485 Selection
JP4	LCD Voltage Selection
JP5	COM2 RS-232/422/485 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 of connectors:

Connectors

Label	Function
CN1	Front panel connector
CN2	External power connector
CN3	PC/104 connector
CN4	Keyboard/ Mouse connector
CN5	PC/104 connector
CN6	USB connector
CN7	VGA connector
CN8	Parallel port connector
CN9	IDE connector
CN10	COM1 RS-232 connector
CN11	Floppy connector
CN12	COM2 RS-232/422/485 connector
CN13	TTL LCD connector
CN14	10/100Base-T Ethernet connector
CN15	Main power connector
CN16	Compact Flash 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.

Open   **Closed**   **Closed 2-3**
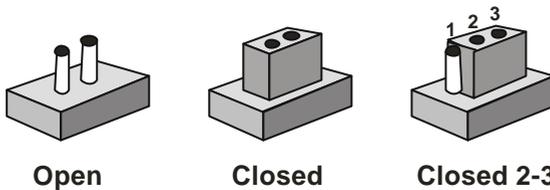
A pair of needle-nose pliers may be helpful when working with jumpers.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

Generally, you simply need a standard cable to make most connections.

2.7 Clear CMOS (JP1)

Warning:

To avoid damaging the computer, always turn off the power supply before setting "Clear CMOS." Before turning on the power supply, set the jumper back to "Normal."

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

2.8 LCD Clock Selection (JP2)

You can select the LCD clock by setting JP2. The following chart shows the available options.

JP2	Function
1-2	Clock (Default)
2-3	Reverse Clock

2.9 COM2 RS-232/422/485 Selection (JP3, JP5)

The COM2 port can be selected as RS-232, RS-422 or RS-485 by setting both JP3 and JP5. The following chart shows the jumper setting.

JP3	JP5	Function
1-2, 4-5, 7-8, 10-11	1-2	RS-232 (Default)
2-3, 5-6, 8-9, 11-12	3-4	RS-422
2-3, 5-6, 8-9, 11-12	5-6	RS-485

2.10 LCD Voltage Selection (JP4)

You can select the LCD voltage by setting JP4. The following chart shows the available options.

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

2.11 Front Panel Connector (CN1)

Please connect the power LED, speaker, IDE LED, reset switch,

LAN LED and IrDA etc of your chassis front panel to the Front Panel

connector according to the pin assignment below.

Pin	Signal	Pin	Signal
1	Power LED (+)	2	Power LED (-)
3	Speaker (+)	4	Speaker (-)
5	IDE LED (+)	6	IDE LED (-)
7	Reset (+)	8	Reset (-)
9	LAN Speed LED (+)	10	LAN Speed LED (-)
11	LAN Active LED (+)	12	LAN Active LED (-)
13	IrDA (+5V)	14	IrDA (NC)
15	IrDA (RX)	16	IrDA (GND)
17	IrDA (TX)		

2.12 External Power Connector (CN2)

This supplies secondary power to devices that require −5V and −12V.

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

2.13 PC/104 Connector (CN3)

The PFM-535I's PC/104 connectors give you the flexibility to attach PC/104 modules.

Pin	Signal	Pin	Signal
1	GND	2	GND
3	#SBHE	4	# MEMCS16
5	LA23	6	# IOCS16
7	LA22	8	IRQ10
9	LA21	10	IRQ11
11	LA20	12	IRQ12
13	LA19	14	IRQ13
15	LA18	16	IRQ14
17	LA17	18	#DACK0
19	#MEMR	20	DRQ0
21	#MEMW	22	#DACK5

PC/104 Module		PFM-535I	
23	SD8	24	DRQ5
25	SD9	26	#DACK6
27	SD10	28	DRQ6
29	SD11	30	#DACK7
31	SD12	32	DRQ7
33	SD13	34	+5V
35	SD14	36	# MASTER
37	SD15	38	GND
39	NC	40	GND

2.14 Keyboard/ Mouse Connector (CN4)

The PFM-535I provides a pin header keyboard connector, which supports both a keyboard and a PS/2 style mouse. In most cases, especially in embedded application, a keyboard is not used. If the keyboard is not present, the standard PC/ AT BIOS will report an error or failure during the power-on self test (POST) after resetting the PC.

The PFM-535I's BIOS standard setup menu allows you to select "Absent/ Present" for your keyboard under the Advanced CMOS Setup section. This allows non-keyboard operation in embedded system applications without the system halting during the POST. When "PS/2 mouse support" is enabled, your PS/2 mouse is automatically detected by the system.

PC/104 Module		PFM-535I	

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

2.15 PC/ 104 Connector (CN5)

The PFM-535I's PC/ 104 connectors give you the flexibility to attach PC/104 modules.

Pin	Signal	Pin	Signal
1	# IOCHCHK	2	GND
3	SD7	4	RESETDRV
5	SD6	6	+5V
7	SD5	8	IRQ9
9	SD4	10	-5V
11	SD3	12	DRQ2
13	SD2	14	-12V
15	SD1	16	# ZWS
17	SD0	18	+12V
19	IOCHRDY	20	GND
21	AEN	22	#SMEMW
23	SA19	24	#SMEMR
25	SA18	26	# IOW
27	SA17	28	# IOR

PC/104 Module		PFM-535I	
29	SA16	30	# DACK3
31	SA15	32	DRQ3
33	SA14	34	# DACK1
35	SA13	36	DRQ1
37	SA12	38	# REFRESH
39	SA11	40	SYSCLK
41	SA10	42	IRQ7
43	SA9	44	IRQ6
45	SA8	46	IRQ5
47	SA7	48	IRQ4
49	SA6	50	IRQ3
51	SA5	52	# DACK2
53	SA4	54	TC
55	SA3	56	BALE
57	SA2	58	+5V
59	SA1	60	OSC
61	SA0	62	GND
63	GND	64	GND

2.16 USB Connector (CN6)

The PFM-535I provides two USB (Universal Serial Bus) interfaces, which give complete plug and play and also hot attach/ detach for up to 127 external devices. The USB interfaces comply with USB specification rev. 1.0 and are fuse protected.

The USB interfaces are accessed through a 10-pin flat-cable connector, CN6. The adapter cable has a 10-pin connector on one end and two USB connectors on the bracket.

The USB interfaces can be disabled in the system BIOS setup.

Pin	Signal	Pin	Signal
1	+5V	2	GND
3	USBD1-	4	GND
5	USBD1+	6	USBD2+
7	GND	8	USBD2-
9	GND	10	+5V

2.17 VGA Connector (CN7)

The PFM-535I's SVGA interface can facilitate conventional CRT displays. The card has a connector to support CRT VGA monitors.

CRT display connector (CN7)

CN7 is a 16-pin, pin header housing connector. Please use the VGA cable to convert the pin header housing connector into a

connector for conventional CRT displays.

Pin	Signal	Pin	Signal
1	RED	2	+5V
3	GREEN	4	GND
5	BLUE	6	NC
7	NC	8	DDCDAT
9	GND	10	HSYNC
11	GND	12	VSYNC
13	GND	14	DDCCLK
15	GND	16	NC

2.18 Parallel Port Connector (CN8)

Normally, the parallel port is used to connect the board to a printer. The PFM-535I includes a multi-mode (ECP/EPP/SPP) parallel port. It is accessed via CN8, a 26-pin flat-cable connector.

You will need an adapter cable if you use a traditional DB-25 connector. The adapter cable should have a 26-pin connector on one end and a DB-25 connector on the other.

PC/104 Module		PFM-535I	
Pin	Signal	Pin	Signal
1	# STORBE	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

2.19 IDE Connector (CN9)

The built-in Enhanced IDE (Integrated Device Electronics) controller supports up to two IDE devices, including CD-ROM drives, tape backup drives, a large hard disk drive and other IDE devices.

Connecting the hard drive

Connecting drives is done in a daisy-chain fashion. It requires one or two cables, depending on the drive size. 1.8" and 2.5" drives need a 1x44-pin to 2x44-pin flat-cable connector. 3.5" drives need

a 1x44-pin to 2x40-pin connector.

Wire number 1 on the cable is red or blue, and the other wires are gray.

1. Connect one end of the cable to CN9. Make sure that the red (or blue) wire corresponds to pin 1 on the connector, which is labeled on the board (on the right side).

2. Plug the other end of the cable into the Enhanced IDE hard drive, with pin 1 on the cable corresponding to pin 1 on the hard drive. Unlike floppy drives, IDE hard drives can connect to either end of the cable. If you install two drives, you will need to set one as the master and one as the slave by using jumpers on the drives. If you install just one drive, set it as the master.

PC/104 Module		PFM-535I	
Pin	**Signal**	**Pin**	**Signal**
1	#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	NC
21	REQ	22	GND
23	# IOW	24	GND
25	# IOR	26	GND
27	IOREADY	28	GND
29	# DACK	30	GND
31	IRQ14	32	NC
33	ADDR1	34	NC
35	ADDR0	36	ADDR2
37	#CS1	38	#CS3
39	HDDLED	40	GND
41	+5V	42	+5V
43	GND	44	NC

2.20 COM1 RS-232 Connector (CN10)

Different devices implement the RS-232 standard in different ways.
If you are having problems with a serial device, be sure to check the
pin assignments below for the connector.

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

2.21 Floppy Connector (CN11)

You can attach one 3.5" floppy drive to the PFM-535I's onboard
controller.   A 34-pin flat-cable connector is fitted on one end of the
cable converter, while the other end has one floppy disk drive
connector.   It consists of a 34-pin flat-cable connector (for the 3.5"
drives).

Connecting the floppy drive

1. Plug the 34-pin flat-cable connector into the cable converter.
   Make sure that the red wire corresponds to pin 1 on the
   connector.

2. Attach the appropriate connector at the other end of the cable to

the floppy drive(s). You can use only one connector in the set. The set at the other end (after the twist in the cable) connects to the A: drive.

When connecting a 3.5" floppy drive, you may have some difficulties in determining which pin is number one. Look for a number on the circuit board indicating pin number one. In addition, you should check if the connector on the floppy drive has an extra slot. If the slot is up, pin number one should be on the right. Please refer to any documentation that came with the drive for more information.

Pin	Signal	Pin	Signal
1	GND	2	#REDWC
3	GND	4	NC
5	GND	6	#DS1
7	GND	8	# INDEX
9	GND	10	# MOTOR A
11	GND	12	# DRIVE SELECT B
13	GND	14	# DRIVE SELECT A
15	GND	16	# MOTOR B
17	GND	18	#DIR
19	GND	20	#STEP
21	GND	22	#WRITE DATA
23	GND	24	#WRITE GATE

PC/104 Module		PFM-535I	
25	GND	26	#TRACK0
27	GND	28	#WRITE PROTECT
29	GND	30	#READ DATA
31	GND	32	#SIDE 1
33	GND	34	#DISK CHANGE

2.22 COM2 RS-232/422/485 Connector (CN12)

Different devices implement the RS-232/422/485 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments below for the connector.

Pin	Signal	Pin	Signal
1	DCD (422 TXD-/485DATA-)	2	RXD (422RXD+)
3	TXD (422 TXD+/485DATA+)	4	DTR (422RXD-)
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	NC

2.23 TTL LCD Connector (CN13)

CN13 is a 40-pin dual-in-line header and is used to connect a LCD display.

Pin	Signal	Pin	Signal
1	+5V	2	+5V

PC/104 Module		PFM-535I	
3	GND	4	GND
5	+3.3V	6	+3.3V
7	ENBKL	8	GND
9	GND	10	GND
11	BLUE0	12	BLUE1
13	BLUE2	14	BLUE3
15	BLUE4	16	BLUE5
17	GND	18	GND
19	GREEN0	20	GREEN1
21	GREEN2	22	GREEN3
23	GREEN4	24	GREEN5
25	GND	26	GND
27	RED0	28	RED1
29	RED2	30	RED3
31	RED4	32	RED5
33	GND	34	GND
35	CLOCK	36	VSYNC
37	DE	38	HSYNC
39	NC	40	ENAVEE

2.24 10/100Base-T Ethernet Connector (CN14)

The PFM-535I is equipped with a high performance 32-bit PCI-bus Fast Ethernet interface which is fully compliant with IEEE802.3u 10/100Base-T specifications. It is supported by all major network operating systems.

10/100Base-T connects to the PFM-535I via an adapter cable to the 10-pin 2mm connector.

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-

2.25 Main Power Connector (CN15)

This supplies main power to the PFM-535I (+5V), and also 12V power to the backlight control.

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

2.26 CompactFlash Socket (CN16)

The PFM-535I is equipped with a CompactFlash type I socket on the solder side, which supports the IDE interface CompactFlash card. The socket itself is specially designed to prevent any incorrect installation of the CompactFlash card. When installing or removing the CompactFlash card, please make sure that the system power is off.

The CompactFlash card acts as a disk drive in your PC system. To fit the AAEON CompactFlash card into the PFM-535I, simply plug it into the designated connector. It will only fit when the red triangle on the CompactFlash card is aligned with the triangle on the connector. The card will not fit any other way (do NOT use excessive force).

Pin	Signal	Pin	Signal
1	GND	2	DATA3
3	DATA 4	4	DATA5
5	DATA 6	6	DATA7
7	# CS1	8	GND
9	GND	10	GND
11	GND	12	GND
13	+5V	14	GND
15	GND	16	GND
17	GND	18	ADDR2
19	ADDR1	20	ADDR0
21	DATA0	22	DATA1
23	DATA2	24	NC
25	GND	26	GND
27	DATA11	28	DATA12

PC/104 Module		PFM-535I	
29	DATA13	30	DATA14
31	DATA15	32	# CS3
33	GND	34	# IOR
35	#IOW	36	+5V
37	IRQ15	38	+5V
39	CSEL	40	NC
41	#RESET	42	IOREADY
43	NC	44	+5V
45	DASP	46	DIAG
47	DATA8	48	DATA9
49	DATA10	50	GND

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 boards CMOS memory. If they do not match, the program outputs an error message. You will the 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-535I CMOS memory has an integral lithium battery backup. The battery backup should last ten years in normal service. However, you will need to replace the complete unit when it finally runs down.

3.2 Award BIOS Setup

Awards BIOS ROM has as built-up 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 <Del> immediately. This will allow you to enter Setup.

Standard CMOS setup

When you choose the STANDARD CMOS SETUP option from the INITIAL SETUP SCREEN menu, the screen shown below is displayed. 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 left bottom of the Menu screen.

BIOS features setup

By choosing the BIOS FEATURES SETUP option from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the PFM-535I.

Chipset features setup

By choosing the CHIPSET FEATURES SETUP option from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the PFM-535I.

Power management setup

By choosing the POWER MANAGEMENT SETUP option from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the PFM-535I.

PnP/ PCI configuration

By choosing the PnP/PCI CONFIGURATION option from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the PFM-535I.

Integrated peripherals

By choosing the INTEGRATED PERIPHERALS options from the INITIAL SETUP SCREEN menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the PFM-535I.   The PANEL TYPE by default supports a 18-bit 640x480 TFT LCD panel display.

Change password

To change the password, choose the PASSWORD SETTING option from the SETUP main menu and press <Enter>.

1. If the CMOS is bad or this option has never been used, a default password is stored in the ROM. The screen will display the following messages:

   Enter password:

   Press <Enter>

2. If the CMOS is good or this option has been used to change the default password, the user is asked for the password stored in the CMOS. The screen will display the following message:

   Confirm Password:

   Enter the current password and press <Enter>.

3. After pressing <Enter> (ROM password) or the current

password (user-defined), you can be at most eight (8) characters long.

Remember-to enable this feature, you must first select either Setup or System in the BIOS FEATURES SETUP.

Save and exit setup

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

Exit without saving

Selecting this option and pressing <Enter> lets you exit the Setup program without recording any new values or changing old ones.

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-535I comes with a CD-ROM which contains most of drivers and utilities of your needs.

There is several installation ways depend on the driver package under different Operating System application.

We recommend that the system driver installation procedure must be performed first.

If you utilize Windows NT series OS, you are strongly recommended to download the latest version Windows NT Service Pack from Microsoft website and install it before installing any driver.

4.1 Installation 1:

Application for Windows 9x/ME/NT 4.0

1. Insert the PFM-535I CD-ROM into the CD-ROM Drive.
2. From the CD-ROM, select the desired component Driver folder, select the desired Operation System folder to double click on the Setup.exe icon. A driver installation screen will appear.

    (*Notice: take VGA driver installation under Window 98 for example, choose the corresponding folder depending on your OS*)
3. A driver installation screen will appear, please follow the onscreen instructions to install the driver in sequence and click on the Next button.

(*Notice: In some cases the system will ask you to insert Windows 98 CD Diskette and key in its path. Then click on the OK button to key in path.*)

4. Click on the **Finish** button to finish installation process. And allow the system to reboot.

4.2 Installation 2:

Applicable for Windows 9x/ ME

1. Insert the **PFM-535I CD-ROM** into the CD-ROM Drive.

2. Click on **Start** button, select the **Settings**, then click on the **Control Panel** icon.

3. Double click on the **Add/ Remove Hardware** icon and **Add New Hardware Wizard** will appear. Click on the **Next** button.

4. Select **Search for the best driver for your device (Recommended)** and click on the **Next** button.

5. Select **Specify a location**, click on **Hard Disk** button then key in the CD-ROM path and specify component drivers and OS folders. Then click on the **Next** button.

6. The Wizard shows that Windows driver file search for the device: (For example, Ethernet devices, the list appear **Realtek RTL8139/ 810X Family PCI Fast Ethernet NIC**). Click on the **Next** button.

7. The system will ask you to insert Windows 98 CD Diskette.

Click on the **OK** button to insert Diskette and key in path.

8. Click on the **OK** button.

9. Click on the **Finish** button to finish installation process. And allow the system to reboot.

4.3 Installation 3:

Applicable for Windows NT 4.0

1. Insert the **PFM-535I CD Diskette** into the CD-ROM Drive.

2. Start system with Windows NT 4.0 installed. **IMPORTANT:** When the "Please select the operating system to start…" message is displayed, select "Windows NT Workstation Version 4.00 [VGA mode]."

3. From **Start**, select the **Setting group**, and then click on the **Control Panel** icon.

4. In the Control Panel, select the desired device and click on the icon.

5. Follow the step-by-step instruction and click on **OK** button.

6. Click on the **Hard Disk…**button.

7. Key in CD-ROM path and specify component drivers, and then click on the **OK** button.

8. From the list of displayed devices, select your desired device.

9. If a message appears starting the driver is already installed on the system, and asks if you want to use the current or

new drivers, be sure to select the **New** button.

10. If prompted for the driver diskette a second time, click on

the **Continue** button.

(*Notice: In some cases the system will ask you to insert*

Windows NT CD Diskette. Follow its instructions to

complete the setup procedures.)

11. When the message **"The drivers were successfully**

installed" is displayed, remove the display driver diskette,

and then click on the **OK** button.

12. Reboot the system.

Appendix

A

Programming the Watchdog Timer

Watchdog Timer

PFM-535I contains a watchdog timer reset pin. (GP16)

All reference material can be found on the following pages.

```
=================================================*
*
** Title : WatchDog Timer Setup Utility (for W83977 GP16) **

** Company : AAEON Technology Inc. **

** Compiler : Borland C ++ Version 3.0 **

**=================================================
**

      #include <dos.h>

      #include <io.h>

      #include <bios.h>

      #include <stdio.h>

      #include <stdlib.h>

      #include <conio.h>

      /* Set I/O Address : 370/371 or 3F0/3F1 */

      #define IO_INDEX_PORT 0x370

      #define IO_DATA_PORT 0x371
```

```
/* Set Watchdog reset pin : 12/13/16 */

#define watch_dog_output_GP 16


#define UNLOCK_DATA 0x87

#define LOCK_DATA 0xAA

#define DEVICE_REGISTER 0x07


void EnterConfigMode()

{

outportb(IO_INDEX_PORT, UNLOCK_DATA);

outportb(IO_INDEX_PORT, UNLOCK_DATA);

}

void ExitConfigMode()

{

outportb(IO_INDEX_PORT, LOCK_DATA);

}


void SelectDevice(unsigned char device)

{
```

```
outportb(IO_INDEX_PORT, DEVICE_REGISTER);

outportb(IO_DATA_PORT, device);

}

unsigned char ReadAData(short int reg)

{

outportb(IO_INDEX_PORT, reg);

return (inportb(IO_DATA_PORT));

}

void WriteAData(unsigned char reg, unsigned char data)

{

outportb(IO_INDEX_PORT, reg);

outportb(IO_DATA_PORT, data);

}

void SetWatchDogTime(unsigned char time_val)

{

EnterConfigMode();

SelectDevice(8);

//Set Register F2

//Set Watch-Dog Timer 1~ 256
```

```
WriteAData(0x30, 0x01);

WriteAData(0xF2, time_val);

// set counter counts in second (or minute)

// Register F4 Bit 6 = 0/1 (minutes/seconds)

// For w83977EF only

WriteAData(0xF4, 0x40);

ExitConfigMode();

}


void init_w83977tf_aw_watchdog()

{

short int value;

//Enter W83977 Configure Mode

EnterConfigMode();

//Select Device 7

SelectDevice(7);

//Set Device Active

WriteAData(0x30, 0x01);

//caution:skip this step will be a mistake!!
```

```
if (watch_dog_output_GP==12)

{

//Set Register E2 to define GP12

WriteAData(0xE2, 0x0A);

}

else if(watch_dog_output_GP==13)

{

//Set Register E3 to define GP13

WriteAData(0xE3, 0x0A);

}

else if(watch_dog_output_GP==16)

{

//Set Register E6 to define GP16

WriteAData(0xE6, 0x0A);

}

//Select Device 8

SelectDevice(8);

//Set Register F3

//keyboard and mouse interrupt reset Enable
```

```
//When Watch-Dog Time-out occurs,Enable POWER LED

output

WriteAData(0x30, 0x01);

WriteAData(0xF3, 0x0E);

//caution:skip this step will be a mistake!!

if (watch_dog_output_GP==12)

{

//Set Register 2A (PIN 57) Bit 7 = 0/1 (KBLOCK/GP12)

//set to GP12 for WD Rst

WriteAData(0x2A,ReadAData(0x2A)|0x80);

}

else if(watch_dog_output_GP==13)

{

//Set Register 2B (PIN 58) Bit 0 = 0/1 (KBLOCK/GP13)

//set to GP13 for WD Rst

WriteAData(0x2B,ReadAData(0x2B)|0x01);

}

else if(watch_dog_output_GP==16)

{
```

```
//Set Register 2C (PIN 119) Bit 5-4 = 01 (GP16)

//set to GP16 for WD Rst

WriteAData(0x2C,ReadAData(0x2C)|0x10);

}

//Exit W83977 Configure mode

ExitConfigMode();

}

void main(int argc, char* argv[])

{

int time_value=0;

char *ptr;

printf("winBond 83977 WatchDog Timer Setup Utility

Version 1.0 \n");

printf("Copyright (c) 2000 AAEON Technology Inc.\n");

printf("This version only for W83977 that using GP%d to

Reset System.\n",watch_dog_output_GP);


if (argc == 1)

{
```

```
printf("\n Syntax: WATCHDOG [time] \n");

printf(" time range : 1 ~ 256 \n\n");

return ;

}

if (argc > 1)

{

ptr = argv[1];

time_value = atoi(ptr);

}

if (time_value > 0 && time_value < 256)

{

SetWatchDogTime((unsigned char) time_value);

init_w83977tf_aw_watchdog();

printf("Watch Dog Timer set up : %d \n",time_value);

}

}
```