

NuPRO-800 Series

Full Size Dual Pentium-III Industrial SBC

User's Guide

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Challenge Description			
Suggestions to ADLINK			

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How to Use This Manual

This manual is designed to help you to use the NuPRO-800/801.

- Chapter 1 Introduction** gives an overview of the product features and specifications.
- Chapter 2 Installation** describes how to install the SBC. The PCB layout, jumper setting and connector pin assignments are shown.
- Chapter 3 BIOS Configuration** describes how to get the BIOS configuration information
- Chapter 4 SCSI Drivers Installation** describes how to install the SCSI drivers in a Windows based environment.
- Chapter 5 VGA Drivers Installation** describes how to install the VGA drivers in a Windows based environment.
- Chapter 6 LAN Drivers Installation** describes how to install the Intel 82559 LAN drivers in a Windows based environment.
- Chapter 7 Watchdog Programming** describes how to the watchdog timer.
- Chapter 8 Hardware Doctor Utility** shows the functionality of the hardware doctor utility.

NuPRO-800 Series Function List

Model	NuPRO-800	NuPRO-801
Processor	Pentium III	Pentium III
Processor Socket	Socket 370	Socket 370
Chipset	Intel 82443BX / 82371EB	Intel 82443BX / 82371EB
BIOS	Award PnP BIOS	Award PnP BIOS
L2 cache	CPU Integrated	CPU Integrated
Max. SDRAM	768 MB	768 MB
Memory Sockets	168-pin DIMM x 3 with ECC capability	168-pin DIMM x 3 with ECC capability
VGA CRT	SMI Lynx 3DM4 SM721 AGP	SMI Lynx 3DM4 SM721 AGP
Ethernet (10/100Mbps)	Intel 82559	Intel 82559
SCSI	LSI/SYMBIOS 53C895	N.A
Multi I/O Chip	Winbond W83977EF	Winbond W83977EF
Enhanced IDE	Yes	Yes
2S/1P	Yes	Yes
USB	Yes	Yes
IrDA	Yes	Yes
H/W Monitoring	Winbond 83782	Winbond 83782

1

Introduction

This manual is designed to provide you information on the NuPRO-800 series CPU boards. The information inside this user's manual can be applied to both NuPRO-800 and NuPRO-801, except that the SCSI relative information is for NuPRO-800 only. Therefore, we will only use the NuPRO-800 model number to present both 800 and 801 in this user's manual.

The topics covered in this chapter are as follows:

- Checklist
- Introduction
- Features
- Specifications

1.1 Checklist

Please check that your package is complete and contains the items below. If you discover damaged or missing items, please contact your dealer.

- The NuPRO-800 Industrial Computer Main Board
- This User's Manual
- One IDE ribbon cable
- One floppy ribbon cable
- Mounting bracket with cable for 1 serial ports and 1 parallel port
- Mounting bracket with cable for 2-port USB ports
- One SCSI flex cable (for NuPRO-800 only)
- One ADLINK CD contains drivers and utilities

1.2 Introduction

The NuPRO-800 industrial computer is optimized for dual Pentium III CPU. This board is based on the Intel 443BX chipset and is fully designed for harsh industrial environment.

The on board AGP4X VGA, 10/100 Mbps Ethernet and optional Ultra SCSI interface provide the most advanced interface capability and make it suitable for CTI and high end server applications.

The key components inside are chosen on the long-term availability criterion, such as Intel Chipset and SMI APG chip. We guarantee this product will be available until the end of Year 2005. Even longer life is still possible which is dependent on the marketing situation. We also accept to extend the product life cycle based on OEM contract.

1.3 Features

- Dual Pentium III CPU processors
- Best CPU cooling design concept
- PCB layout considers minimum trace length of all the critical bus includes front-side-bus (FSB), memory bus, AGP bus and PCI bus.
- Long MTBF and stability (all critical bypass capacitors are using Sanyo's OS CON capacitors which provide 20 years life time at 65 °C.)
- FSB Frequency: 100 MHz
- Intel 440BX chipset
- On board APG2X VGA using SMI721 chipset with 4MB embedded Video RAM
- On board 10/100 Mbps Ethernet interface using Intel 82559 chip
- On board optional Ultra-II SCSI interface
- ISA High Drive 64mA
- Programmable watchdog timer
- Hardware Monitoring

1.4 Specifications

- **Processor:** Dual Intel Pentium III FC-PGA CPU
 - **Processor Socket:** Socket-370 connector
 - **Cache:** 256KB Level 2 build-in Pentium III CPU (refer to the specifications of the Intel CPU.)
- **Front Side Bus (FSB) Frequency:** 100MHz
- **Chipset:**
 - Intel 82440BX AGPset: 82443BX and 82371EB(PIIX4)
 - Optimized SDRAM supported
- **Memory Sockets:**

Three 168-pin DIMM sockets, maximum 768 MB SDRAM
Memory type: PC-100 SDRAM with or without ECC capability
- **BIOS:** Award BIOS, PnP support
 - **DMI BIOS Support:** Desktop Management Interface (DMI) allows users to download system hardware-level information such as CPU type, CPU speed, internal/external frequencies and memory size.
 - **Green Function:** Power management via BIOS, activated through mouse/keyboard movement, support system soft power off (via ATX power supply)
 - **Customized power-on screen (for OEM options)**
 - **Write protection, provide anti-virus capability**
- **AGP VGA Interface:**
 - AGP-bus VGA/LCD controller SMI Lynx3DM4 SM721, with build-in 4M VRAM (8M VRAM is available for OEM)
 - AGP 2X, ACPI and VESA compliant
 - 128-bit, single clock cycle 2D drawing engine
 - High performance, power managed 3D acceleration engine
 - Support up to 1600x1200 resolution both in VGA and TFT LCD
 - Simultaneous display for both VGA and LCD
 - RAMDAC Latch-up protection
 - Power lines on VGA connector are with over-current protection by resettable fuse.
- **SCSI Interface:**
 - LSI / SYMBIOS SYM 53C895 advanced SCSI controller
 - Wide Ultra-2 SCSI protocol up to 80 MB/s transfer rate (max.)
 - LVD link to extend cable length up-to 12 meters

- Backward compatible with Wide Ultra-2 SCSI, Wide Ultra SCSI, Ultra SCSI, and Fast SCSI
- Auto Switch transmission modes for different kind of devices connected, suppose Signal-ended (SE), Low Voltage Differential (LVD), High Voltage Differential (HVD)
- **Ethernet Interface:**
 - Intel 82559 chipset with 32-bit PCI interface
 - 10/100Mbps operation in a single port PCI bus master architecture
 - IEEE 802.3 10base-T and 100base-TX compatible
 - IEEE802.3u auto-negotiation support for automatic speed selection
 - IEEE 802.3X (100base-TX Flow control support)
 - Wake On Lan support
 - Optional Alert-On LAN II (AOL2)
- **USB Interface:**

Two USB pin-header connectors, compliant with USB Specification Rev. 1.1, Individual port is with over-current protection by using resettable fuse.
- **Enhanced IDE:**

Bus Master IDE controller, two EIDE interfaces for up to four IDE devices, including HDD, ATAPI CD-ROM, LS120, and ZIP drives. Support PIO Mode 3/4 or Ultra DMA/33 IDE devices,
- **Super I/O:**
 - **Chipset:** Winbond W83977EF:
 - **Parallel Port:**
 - One high-speed parallel port, SPP/EPP/ECP mode
 - ESD protection to 4KV and downstream device protection to 30V
 - **Serial Port:**
 - Two 16C550 UART compatible RS-232 COM ports
 - ESD protection to 2KV
 - **FDD Interface:** Support two floppy drives (360KB, 720KB, 1.2MB, 1.44MB, 2.88MB)
 - **Keyboard and Mouse Connectors:** PS/2 type mini-DIN connectors, supports a 5-pin internal keyboard connector. All connectors are with over-current protection.
 - **IrDA:** Supports 5-pin IrDA interface with over-current protection
- **PCI Compliance:** Fully compliant to PCI rev. 2.1 standards and PICMG 1.0 PCI-ISA standard

- **Hardware Monitoring:** Winbond W83782D, Monitoring CPU temperature, 2 CPU fans speed, case open and DC Voltages
- **Watchdog Timer:**
 - Programmable I/O port 2Eh and 2Fh to configure watchdog timer, programmable timer 1~15300 seconds.
 - Bundled easy-programming source code and library for DOS, Windows 95, 98, NT
- **ISA High Driving Capability:**
ISA bus high driving capability up to 64mA on all data address and control lines
- **Flash Storage Device:** Support DOM (8MB~2GB) IDE flash module
- **Environmental:**
Storage Temperature: -20°C to 80°C
Operation Temperature: 0°C to 60°C
Humidity: 5% to 95%
- **Power Supply:** Support ATX features
- **Dimension:** 338mm x 122mm(13.3 x 4.8)
- **Power Requirement:**

Configurations	+5V	+12V	-12V	+5VSB
Single Pentium III 600 MHz 128MB	11A	200mA	50mA	50mA
Single Pentium III 800 MHz 256MB x 3	13A	200mA	50mA	50mA
Dual Pentium III 600 MHz 128MB	18A	200mA	50mA	50mA
Dual Pentium III 800 MHz 256MB x 3	22A	200mA	50mA	50mA

Note 1: The above values are the maximum power requirement for SBC with CPU and RAM only, the CPU is running under 100% loading. The power for all the other peripheral devices such as keyboard, mouse, add-on cards, HDD, or HDD is not included.

Note 2: The fan power, which uses +12V, is not included.

Installation

This chapter provides information on how to use the jumpers and connectors on the NuPRO-800 in order to set up a workable system. The topics covered are:

- CPUs and coolers Installation
- Memory Installation
- Jumpers Setting
- Connectors Pin Assignments
- Driver Installation Tips

2.1 CPUs and coolers Installation

The NuPRO-800 industrial computer Main board supports two Socket-370 processor sockets for Intel Pentium III FC-PGA processors. User can either install one or two CPUs. Please note that: unlike the SBC from some vendors, when user installs only one CPU, it is not necessary to add any extra terminator board on CPU socket

Before inserting the CPU, make sure the notch on the corner of the CPU corresponds with the notch on the inside of the socket.

Please carefully choose the CPU coolers (include FAN and heat sink), because of the Pentium-III CPUs need stronger coolers for heat dissipation. Especially when the CPU frequency is higher than 660MHz, **we recommend using the coolers with copper heat-sink to enhance the heat dissipation capability.**

Note: Please ensure the CPU cooler tightly contact with the surface of FC-PGA Pentium-III CPU. We also recommend putting the heat-dissipation glue to enhance the heat-dissipation. If the coolers are not installed well, the CPU overheating will cause system hang or unstable.

After you have installed the processor into place, connect the FAN connectors to the board, then to check whether if the jumpers for the CPU type and speed are correct. To use FANs with speed sensor is also recommended.

FN1, FN2: CPU fan power connectors

FN1 and FN2 are 3-pin headers for the CPU fan. The fan must use 12V power.



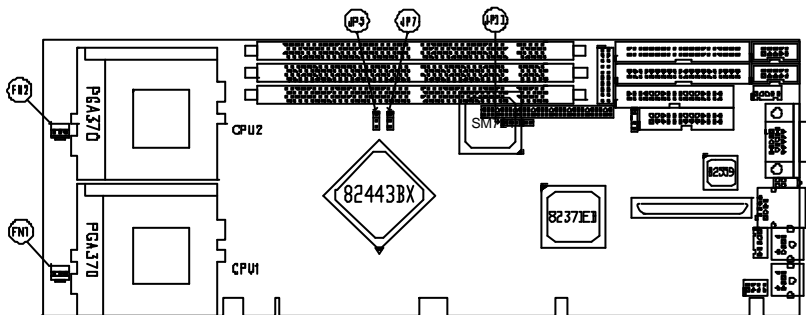
Pin #	Signal Name
1	Fan speed
2	+12V
3	GND

2.2 Memory Installation

The NuPRO-800 industrial computer main board supports three 168-pin DIMM socket for a maximum total memory of 768 MB. The memory modules can come in sizes of 64MB, 128MB and 256MB SDRAM.

2.3 Jumpers on the NuPRO-800

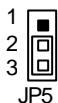
There are only 3 jumpers you need to setup before installing the NuPRO-800.



The following table shows the functions of the jumpers.

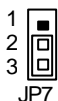
JP5	FSB Frequency
JP7	Clear CMOS
JP11	LCD Power supply selection

2.3.1 JP5: FSB (front-side-bus) Frequency



JP5	FSB Frequency	
1-2	66MHz	(Default setting)
2-3	100MHz	

2.3.2 JP7: Clear CMOS



JP7	Function	
1-2	Clear CMOS	(Default setting)
2-3	Normal	

2.3.3 JP11: LCD Power Selection



JP11	LCD Power	
1-2	+5V	(Default setting)
2-3	+3.3V	

2.4 Connectors Pin Assignments

The connectors on the NuPRO-800 allow you to connect external devices such as keyboard, floppy disk drives, hard disk drives, printers, etc. The following tables list the connectors on NuPRO-800 and their respective functions.

- CN1: Case Open Connector
- CN2: Flat Panel LCD Connectors
- CN3: Miscellaneous Signals Connector
- CN6: CN7: EIDE Connectors
- CN5: Floppy Drive Connector
- CN8: Parakek Port Connector
- CN9: 68-PIN Ultra SCSI Connector
- CN11: Ethernet RJ45 Connector
- CN10: USB Ports
- CN12: Internal keyboard connector
- CN13: IrDA interface connector
- CN14: VGA CRT Connector
- CN15: CN16: Serial Port (CN16: COM1, COM15: COM2)
- CN17: PS/2 Mouse Connector
- CN18: PS/2 Keyboard Connector
- LED1: LAN Activity Indicators

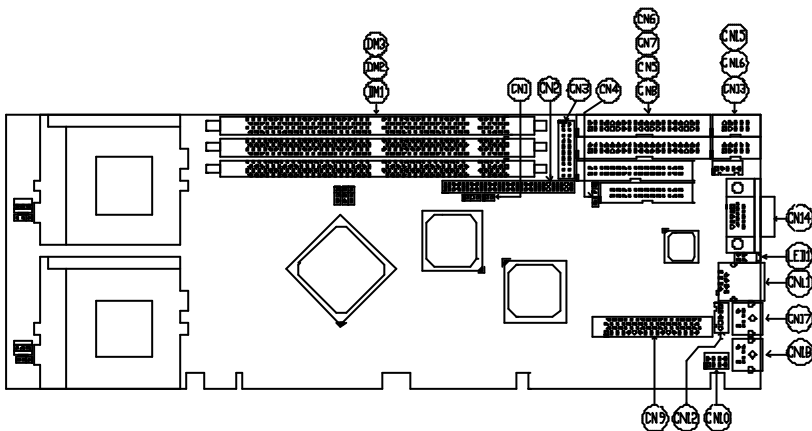
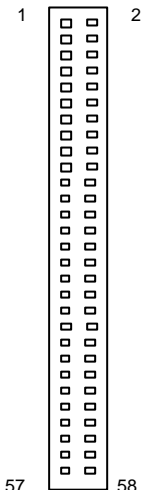


Figure 2.4 Connector location on the NuPRO-800

CN2: Flat Panel LCD Connectors

CN4 is a 58-pin (dual in line header) for flat panel LCD displays. The following shows the pin assignments of this connector. It can support both 24-bit or 36-bit LCD interface.



Signal Name	Pin #	Pin #	Signal Name
+12V	1	2	+12V
GND	3	4	GND
LCD VEE	5	6	LCD VEE
ENPVEE	7	8	GND
PD0	9	10	PD1
PD2	11	12	PD3
PD4	13	14	PD5
PD6	15	16	PD7
PD8	17	18	PD9
PD10	19	20	PD11
PD12	21	22	PD13
PD14	23	24	PD15
PD16	25	26	PD17
PD18	27	28	PD19
PD20	29	30	PD21
PD22	31	32	PD23
GND	33	34	GND
SHFCLK	35	36	FLM
M	37	38	LP
GND	39	40	ENABKL
GND	41	42	LCD VDD
ENAVDD	43	44	LCD VEE
Key (N/C)	45	46	Key (N/C)
PD24	47	48	PD25
PD26	49	50	PD27
PD28	51	52	PD29
PD30	53	54	PD31
PD32	55	56	PD33
PD34	57	58	PD35

Note 1: The +12V power sources, which are designed to provide power to back light inverter, is protected by 1.1A resettable fuse.

Note 2: LCD VEE is the power source for LCD logic circuit. The power of 3.3V or 5V voltage is selectable by JP11. The power ON/OFF is controlled by ENPVEE signal. The power is with over-current protection by resettable fuse.

Note 3: LCD VDD power source, which is controlled by the ENAVDD signal, comes from +3.3V. The power is with over-current protection by resettable fuse. This power is for providing the LCD bias voltage.

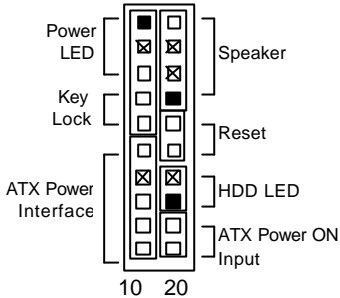
CN1: Case Open Connector



Shorted	Open
Case Closed	Case Open

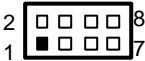
The signal is connected to the limit switch sensor of the chassis to detect the case open or closed.

CN3: Miscellaneous Signals Connector



Pin #	ATX Power Interface Signals
6	GND
7	X
8	PS_ON to ATX Power
9	5V SB (standby +5V)
10	5V SB (standby +5V)

CN10: USB Ports



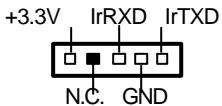
Pin #	Pin #	Signal Name
1	2	VCC
3	4	USB0- / USB1-
5	6	USB0+ / USB1+
7	8	Ground

CN12: Internal Keyboard Connector



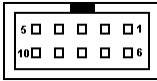
Pin #	Signal Name
1	Keyboard clock
2	Keyboard data
3	NC
4	GND
5	Vcc

CN13: IrDA interface connector



Pin #	Signal Name
1	+3.3V
2	No connect
3	IrRXD
4	Ground
5	IrTXD

CN15, CN16: Serial Port (CN15: COM1, CN16: COM2)



Pin #	Signal Name
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	GND, ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator
10	NC

LED1: LAN Activity Indicators



Location	LED Status	Description
Upper LED: Speed Status	ON	100 Mbps
	OFF	10 Mbps
Lower LED: Link Status	ON	Link
	OFF	Off line
	Blinking	Data transfer in progress

- For the pin assignment of all the others standard connectors, including FDD, parallel port, SCSI, VGA, keyboard, mouse, and Ethernet, please refer to the full user's manual on the ADLINK CD for detail drawing.

2.5 Software Installation Tips

To install the drivers and utility for the NuPRO-800, please refer the detail installation information from the Chapter 4 to Chapter 8. We provide the basic information in this manual, however, for more detail installation information, such as non-Windows OS installation, please refer the extensive explanation inside the ADLINK CD. We put the NuPRO drivers in the following directories:

VGA/APG relative driver	\\NuPRO\Driver\VGA\SM721
LAN relative driver	\\NuPRO\Driver\LAN\82559
SCSI relative driver	\\NuPRO\Driver\SCSI\53C895
Bus mastering IDE driver	\\NuPRO\Driver\IDEDMA33
Watchdog relative driver	\\NuPRO\Driver\WDT
Hardware Doctor Utility	\\NuPRO\Driver\HWDoctor
DMI utility	\\NuPRO\Driver\DMI

In this users manual, the Bus -mastering IDE driver installation is not described because most of the Windows based OS will install those drivers automatically.

Due to the Windows NT is a none plug-and-play OS, we remind you some tips for installing the Windows NT here:

1. We suggest installing the LAN driver before installing any service pack.
2. If you install service pack after the LAN driver, please avoid over-writing the newer LAN relative drivers which installing the service pack.
3. We suggest installing the VGA/APG driver after installing the service pack. Please make sure your service pack do support AGP, service pack 6 or higher is recommend.
4. Once your NT booting procedure is with warning, please check the Event Viewer to make sure what is the really problem. Once the Windows NT is with s trange phenomenal which can not be solved, we suggest to re-install the Windows NT, then install the driver in different sequence again.

3

BIOS Configuration

On the NuPRO-800 BIOS, we provide the following key features:

- **PCI plug and play support**
- **DMI BIOS Support:** Desktop Management Interface (DMI) allows users to download system hardware-level information such as CPU type, CPU speed, internal/external frequencies and memory size.
- **Green Function:** Power management via BIOS, activated through selectable power manager events.
- **Write protection, provide anti-virus capability**
- **LCD BIOS:** Includes LCD Selection Table for 9-types LCD panel, LCD BIOS on/off control
- **SCSI BIOS:** Include the SCSI configurations utility

For detail BIOS setting table, please refer to the user's manual on the CD: ***NP800_BIOS_Manual.PDF*** under ***X:WuPRONuPRO800***

4

SCSI Drivers Installation

This chapter describes SCSI drivers installation for the onboard SCSI controller **LSI (Symbios) 53C895**. The relative drivers are under the following ADLINK CD directory: **X:WuPRO\Drivers\SCSI\53C895**, where X: is the location of the CD-ROM drive.

4.1 Software and Drivers Support

The 82559 drivers support the following OS or platforms:
Windows 98, Windows 95, Windows 2000, Windows NT 4.0

DOS, Novell, UNIX, SCO UNIX, OS2, Linux

All the above drivers are included in the ADLINK CD. In the following sections, we will describe the driver installation for Windows 98, Windows 2000, and Windows NT. For the driver installation of the other OS, please refer the README file under the respective directory.

NOTE: The most updated SCSI drivers can be downloaded from the LSI Logic web site at URL: <http://www.lsilogic.com>.

4.2 Driver Installation on Windows 2000

The Windows 2000 may install the SCSI driver. We recommend you to manually installed the most updated driver, which shipped with ADLINK CD to guarantee the compatibility. After installing the Windows 2000, please update the new drivers by the following procedures.

1. Boot Windows 2000, Click **Start**. Select **Settings** then double-click the **Control Panel**.
2. Double-click on the **System** icon, click **Hardware** tab, click **Device Manager** button.
3. Double-click **SCSI and RAID controllers** entry, Double-click the **Symbios XXX PCI SCSI Adapter** entry.
4. Click **Driver** tab, then click **Update Driver...** button.
5. An Upgrade Device Driver Wizard window starts, click **NEXT>**
6. Select **Display a list of ...**, then click **NEXT>**. The next window may show a list of hardware models.
7. Insert the ADLINK CD and click **Have Disk**.
8. **Browse** the LSI 53C895 driver in the following path: **X:\NuPRODrivers\VGA\53C895\Win2k\winnt\miniport** highlight **oemsetup.inf**, click **OPEN**, then click **NEXT>**.
9. Highlight the model: **Symbios 8952U PCI SCSI Adapter; 53C895 Device**, then click **NEXT>**.
10. Click **NEXT** button. The Windows 2000 may report Digital Signature Not Found, then click **Yes** to continue.
11. Click **Finish** button, then click **CLOSE** button.

4.3 Driver Installation on Windows 98

The Windows 98 will automatically install the SCSI drivers. However, we recommend you to manually installed the most updated driver, which shipped with ADLINK CD to guarantee the compatibility. After installing the Windows 98, please update the new drivers by the following procedures.

1. From the **Control Panel**, double-click **System** icon, click **Device Manager** tab.
2. Double-click **SCSI Adapters** entry, select the **Symbios Logic xxxxx SCSI PCI Host Adapter** entry. Click the **Properties** button.
3. Click **Driver** button, then click **Update Driver...** button.
4. An Upgrade Device Driver Wizard window pop up, click **NEXT>**.
5. Select **Display a list of ...** and click **NEXT>**. The next window allows the user to specify a specific path. Insert the ADLINK CD and click **Have Disk**.
6. **Browse** the 53C895 driver in the following path:

- X:WuPRODrivers\SCSI\53C895Win95&98**, highlight **symc8xx.inf**, click **Open**, click **OK**. The previous window appears with the selected driver displayed as the driver to install.
7. Click **NEXT>** button, then the Wizard summary window appears.
 8. Click **Finish** button, then restart the computer to active the new driver.

4.4 Driver Installation on Windows NT

Before install the SCSI driver on Windows NT, please copy the contents in the following directory **X:WuPRODrivers\SCSI\53C895Win40** into a new formatted floppy diskette. Please note that all the content in the sub-directory must be copied too.

When install the Windows NT into a SCSI HDD, we recommend you to use IDE CD-ROM as CD reader. Before installing the NT, we have to install the SCSI driver from the floppy diskette you made. Please use the following procedure to install the SCSI driver with Windows NT.

1. Start the Windows NT 4.0 installation by booting from the Windows NT CD or floppy diskettes.
2. Press **Enter** when the Welcome to Setup screen appears.
3. The Windows NT 4.0 Workstation Setup window appears next.
4. Press **S** to skip automatic detection and do manual selection. A screen displays the message [**Setup has recognized the following mass storage devices in your computer**].
5. Choose **S** to configure additional SCSI adapters when a screen displays the SCSI adapters found. Move the highlight bar to **Other** and press **Enter**.
6. The system prompts for the manufacturer-supplied hardware support disk. Insert the appropriate Symbios Driver diskette, and press **Enter**.
7. Select **Symbios PCI (53C8XX) Driver** to be shown highlighted. Press **Enter** to proceed.
8. The Windows NT Workstation Setup window reappears. If using an IDE CD-ROM for installation, press **S** to load additional drives. Another window appears.
 - (1) Scroll up and select: **IDE CD-ROM (ATAPI 1.2)....**, Press **Enter**. -or-
 - (2) Configuring additional SCSI adapters, press **Enter**.
9. Upon exiting, a screen displays the message Setup will load support for the following mass storage devices(s). Press **Enter** to continue. This message implies that Windows NT recognizes the miniport driver and the SCSI hardware.
10. At this point, simply follow the Microsoft Windows NT installation procedure.

The Windows NT may already install with a SCSI driver. We recommend you to manually upgrade the driver, which shipped with ADLINK CD to guarantee the compatibility. After installing Windows NT, please update the new drivers by the following procedures.

1. From the **Control Panel**, double-click the **SCSI Adapters** icon.
2. Click **Drivers** tab, click **Add...** button.
3. Insert the floppy diskette into drive A: and click **Have Disk**.
4. In Window NT Setup window, type in **A:** drive in the dialog box, then click **Continue** button.
5. An Install Driver window shows that the SCSI adapter is Symbios Logic PCI 53C8XX, click **OK** to continue.
6. An setup successful windows pop up, click **OK** to continue.
7. Click **Close** button.
8. Click **Close** button, then restart the computer to active the new driver.

5

VGA Drivers Installation

This chapter describes VGA driver installation for the onboard VGA/LCD controller **SM721**. The relative drivers are in the following ADLINK CD directory: **X:WuPRO\Drivers\VGA\SM721**, where X: is the location of the CD-ROM drive. The VGA drivers for Windows 98/95, Windows NT and Windows 2000 are included.

5.1 Driver Installation on Windows 2000

The Windows 2000 may install the standard VG A driver. We recommend you to manually installed the most updated driver, which shipped with ADLINK CD to guarantee the compatibility. After installing the Windows 2000, please update the new drivers by the following procedures.

1. Boot Windows 2000, Click **Start**. Select **Settings** then double-click the **Control Panel**.
2. Double-click on the **System** icon, click **Hardware** tab, click **Device Manager** button.
3. Double-click either on the **Display Adapters** or **Other Devices** entry, Double-click the **Video Controller** or **Silicon Motion Lynx3DM** entry.
4. Click on the **Driver** tab, then click **Update Driver...** button.
5. An Upgrade Device Driver Wizard windows, click **NEXT>**.
6. Select **Display a list of ...**and click **NEXT**.
7. The next window may show a list of hardware type, then select **Display Adapters**, then click **OK**.
8. This window may show a list of VGA model numbers.
9. Insert ADLINK CD and click **Have Disk**.
10. **Browse** the SM721 driver in the following path:
X:WuPRO\Drivers\VGA\SM721\Win2k, highlight **smisetup.inf**, click

- OPEN**, then click **NEXT>**.
11. Highlight the model: **Silicon Motion Lynx3DM**, then click **NEXT>**.
 12. Click **NEXT>** button, The Windows 2000 may report Digital Signature Not Found, then click **Yes** to continue.
 13. Click **Finish** button, then click **CLOSE** button.

5.2 Driver Installation on Windows 98

The Windows 98 may install the standard VGA driver. We recommend you to manually installed the most updated driver, which shipped with ADLINK CD to guarantee the compatibility. After installing Windows 98, please update the new drivers by the following procedures.

1. Boot Windows 98, Click **Start**. Select **Settings** then double-click the **Control Panel**.
2. Double-click **System** icon, click on the **Device Manager** tab.
3. Double-click **Display Adapters** entry, select the **Standard PCI Graphics Adapter (VGA)** entry. Click the **Properties** button.
4. Click on the **Driver** button, then click **Update Driver...** button.
5. An Upgrade Device Driver Wizard windows, click **NEXT>**.
6. Select **Display a list of...** and click **NEXT>**. The next window allows the user to specify a specific path. Insert the ADLINK CD and click **Have Disk**.
7. **Browse** the SM721 driver in the following path: **X:\NuPRODrivers\VGA\SM721Win9x**, highlight **smi.inf**, click **OPEN**. Click **OK**.
8. Click **NEXT>** button, then the Wizard summary window appears.
9. Click **Finish** button, then restart the computer to active the new driver.

5.3 Driver Installation on Windows NT

The Windows NT may install the standard VGA driver while. We recommend you to manually installed the most updated driver, which shipped with ADLINK CD to guarantee the compatibility. After installing Windows NT, please update the new drivers by the following procedures.

1. From the **Control Panel**, double-click the **Display** icon.
2. Click the **Settings** tab, click **Display Type...**, click **Change...** button.
3. Insert ADLINK CD and click **Have Disk**.
4. **Browse** the SM721 driver in the following path:
X:\WuPRODrivers\VGA\SM721\WT40, highlight **smisetup.inf**, click **OPEN**. Click **OK**.
5. A windows shows the **Display is Silicon Motion Lynx Family**, click **OK**, then click **Yes** to continue.
6. An **Installing Driver** window shows successful installing, click **OK** to continue.
7. Click **Close** button.
8. Click **Close** button, then restart the computer to active the new driver.

Note: After installing the VGA/AGP drivers, you may find the driver does not work. This may due to you do not install the NT service pack in advance. We suggest installing the NT service pack 4 or higher version to enable APG capability.

6

LAN Drivers Installation

This chapter describes LAN driver installation for the onboard Ethernet controller **Intel 82559**. The relative drivers are under the following ADLINK CD directory: **X:WuPRODrivers\LAN\82559**, where X: is the location of the CD-ROM drive.

6.1 Software and Drivers Support

The 82559 drivers support the following OS or platforms:

- Windows 98, Windows 95, Windows 2000, Windows NT
- Novell Netware, DOS Setup for Novell NetWare DOS
- UNIX, OS2, Linux

All the above drivers are included in the ADLINK CD. In the following section, we will describe the driver installation for Windows 98, Windows 2000, and Windows NT. For the driver installation of the other OS, please refer the readme file inside the CD.

6.2 Driver Installation on Windows 2000

The Windows 2000 may install the LAN driver. We recommend you to manually installed the most updated LAN driver, which shipped with ADLINK CD to guarantee the compatibility. After installing the Windows 2000, please update the new drivers by the following procedures.

1. Boot Windows 2000, Click **Start**. Select **Settings** then double-click the **Control Panel**.
2. Double-click **System** icon, click **Hardware** tab, click **Device Manager** button.
3. Double-click **Network Adapters** entry, Double-click the **Intel 8255x-based PCI Ethernet Adapter (10/100)** entry.
4. Click **Driver** tab, then click **Update Driver...** button.
5. An Upgrade Device Driver Wizard windows, click **Next>**.
6. Select **Display a list of ...** and click **Next>**. The next window may show a list of hardware models.
7. Insert the CD and click **Have Disk**.
8. Browse the LSI 53C895 driver in the following path: **X:\WuPRO\Drivers\LAN\82559**, highlight **oemsetup.inf**, click **Open**, then click **OK**.
9. Highlight the model: **Intel 8255x- based PCI Ethernet Adapter (10/100)**, then click **NEXT>**. An Update Driver Warning window may pop up, click **Yes** to continue.
10. Click **NEXT>** button, then the Wizard summary window appears.
11. Click **Finish** button, then click **CLOSE** button.

6.3 Driver Installation on Windows 98

The Windows 98 will install the LAN driver automatically. We recommend you to manually updated the LAN, which on the ADLINK CD to guarantee the compatibility. After installing Windows 98, please update the new drivers by the following procedures.

1. Boot Windows 98, Click **Start**. Select **Settings** then double-click the **Control Panel**.
2. Double-click on the **System** icon, click on the **Device Manager** tab.
3. Either Double-click on the **Network Adapters** entry,select the **Intel 8255x-based PCI Ethernet Adapter (10/100)** entry. Click the **Properties** button.
4. Click on the **Driver** button, then click **Update Driver...** button.
5. **Update Device Driver Wizard** starts, click **NEXT**
6. Select **Display a list of ...** and click **NEXT**. The next window allows the user to specify a specific path. Insert the CD and click **Have Disk**.
7. Browse the 82559 driver in the following path:
X:\WuPRODrivers\LAN\82559, highlight **net82557.inf**, click **OK**. The Update Wizard displays the message that it has found the driver. Click OK again to update the driver. Note: Windows 98 may ask you to insert the original Windows 98 CD to install the LAN protocols.
8. Click **NEXT** button, then the Wizard summary window appears.
9. Click **Finish** button, then restart the computer to active the new driver.

6.4 Driver Installation on Windows NT

Before install the LAN driver on Windows NT, please copy the LAN driver in the CD to a floppy diskette. You have to put a new disk into drive A, then type the following batch command under DOS environment to copy the relative NT drivers.

X:\Wupro\Drivers\82559\Makedisk\Makedisk NT

where X is the CD-ROM drive.

Windows NT may ask to installs a LAN driver from its own library of drivers. We recommend you to manually updated the LAN, which on the ADLINK CD to guarantee the compatibility. After installing Windows 98, please update the new drivers by the following procedures.

1. From the **Control Panel**, double-click the **Netwrok** icon, a **Network Configuration** window pop up, click **Yes**.
2. In **Netwrok Setup Wizard**, click **Next>**, click **Select From List...** button.
3. Insert LAN driver floppy diskette into A drive and click **Have Disk**.
4. In the dialog box of **Insert Disk** window, type in **A:**, Click **OK**.
5. A **Select OEM Option** window pop up, click **OK**, then click **Next>**.
6. Select necessary Network Protocols, click **Next>**.
7. Select necessary Network Services, click **Next>**.
8. Click **Next>** until Window NT Setup dialog box pop up. Type in **D:\V386** in the dialog box, then insert the original Windows NT CD, click **Continue**.
9. Then click **OK** until the setup completed.
10. Restart the computer to reboot.

7

Watchdog Programming

7.1 Watchdog Timer Configuration

The Watch Dog Timer (WDT) can monitor the system's status. Once you give a value to WDT, the timer will begin to count down. To re-program a new value to WDT, or move keyboard can restart the WDT. If the system is idle or hang, it will reboot when the timer timeout.

The function of the watchdog timer is to reset the system automatically. It contains a one-second (or one-minute) resolution down counter (in CRF6 of logical device 8 of super I/O chip) and two Watchdog control registers (CRF5 and CRF7 of logical device 8).

We provides the WTC function call for easy use under DOS, Windows 95/98/2000, and Windows NT, please refer the information under **X:WuPROWDT**.

7.2 WDT Programming

In order to simplify the programming code, we provide a sub function for the programmers to implement their software. For DOS, Windows 95 or 98 and Window NT, the sub function format is as follow:

```
out_port (int IOport_number, int Counter_value)
    IOport_number: 0x3F0 -->W83977EF's configuration port.
                  0x2  -->W83627HF's configuration port.
    Counter_value: 0 ~ 15300 (255 minutes)
                  (write a zero to disable the timer)
```

Under DOS, Windows 95 or 98

Make a project program with `wdt.cpp` under Turbo C/C++.

Under Windows NT

The library installation procedure:

- (1) run the setup program under Nt environment.
- (2) reboot the system.

You can also write your own DLL by referring the DOS source we provide.

7.3 How to Test the WDT?

Under DOS, Windows 95 or 98

Open a DOS command prompt and execute the following utility on the CD.

```
X: NuPRO\NuPRO800\WDT\test <n>
/* n = second value. This program can auto detect which Super I/O chip you
use. */
```

Under Windows NT

Before you executing the program under NT, you must run the setup program under Windows NT in advance. Open a DOS command prompt window and execute the following command.

```
test977 <n> : n = second value. For W83977EF
test627 <n> : n = second value. For W83627HF
```

Hardware Doctor Utility

This chapter introduces Hardware Doctor Utility that comes with the CPU board in conjunction with the onboard hardware monitoring function (embedded in Winbond's Super I/O chip W83977). The sections in the following pages describe the functions of the utility.

Hardware Doctor is a self-diagnostic system for PC and must be used with Winbond's W83781D/W83782D IC series products. It will protect PC Hardware by monitoring several critical items including Power Supply Voltage, CPU Fan speed, and CPU & System temperature. These items are important to the operation of system; errors may result in permanent hurt of PC. Once any item is out of its normal range, an obvious warning message will pop up and remind user to make a proper treatment.

The Hardware Doctor utility supports the Windows 98 and Windows NT. The software is stored on the ADLINK CD under the following directory: **X:\WuPROHWDOCTOR\WIN98** and **X:\WuPROHWDOCTOR\WINNT**. Please install the Hardware Doctor by executing the Hwm-98.exe or Hwm-nt.exe respectively under Windows 98 or Windows NT.

For detail user's manual, please refer the HWDDoctor.PDF under the **X:\WuPROHWDOCTOR**.

Appendix A: I/O Address MAP

I/O Address	Description
0000h ~ 000Fh	DMA channel 0-3 Controller.
0020h ~ 0021h	Master Programmable Interrupt Controller.
0040h ~ 0043h	Programmable Interrupt Timer.
0060h ~ 0060h	Keyboard controller data port or keyboard input buffer.
0061h ~ 0061h	Port B control register.
0064h ~ 0064h	Keyboard controller read status or input buffer.
0070h ~ 0073h	Real Time Clock, CMOS.
0080h ~ 0080h	Manufacturing diagnostics port (Port 80)
0080h ~ 0090h	DMA page register.
0094h ~ 009Fh	DMA page register.
00A0h ~ 00A1h	Slave Programmable Interrupt Controller.
00C0h ~ 00DFh	DMA channel 4-7 Controller.
00F0h ~ 00FFh	Math coprocessor.
0170h ~ 0177h	Secondary IDE controller.
01F0h ~ 01F7h	Primary IDE controller.
<i>Manufacturers of expansion boards must avoid using the 0000h ~ 0200h range I/O address.</i>	
0278h ~ 027Fh	Parallel port controller. ²
0290h ~ 029Fh	Sensor Chip access port.
02E8h ~ 02EFh	Serial port controller. ²
02F8h ~ 02FFh	Serial port controller. ²
0372h ~ 0375h	Secondary floppy controller. ²
0376h ~ 0376h	Secondary IDE controller.
0377h ~ 0377h	Secondary floppy controller. ²
0378h ~ 037Fh	Parallel port controller. ²
03B0h ~ 03BBh	MDA I/O address.
03BCh ~ 03BFh	Parallel port controller. ²
03C0h ~ 03DFh	CGA I/O address.
03E8h ~ 03EFh	Serial port controller. ²
03F2h ~ 03F5h	Primary floppy controller. ²
03F6h ~ 03F6h	Primary IDE controller.
03F7h ~ 03F7h	Primary floppy controller. ²
03F8h ~ 03FFh	Serial port controller. ²
Note:	
1. The address is free if system has no such device or the device doesn't use I/O address.	
2. The I/O address is used according to BIOS setting.	

Product Warranty/Service

Seller warrants that equipment furnished will be free from defects in material and workmanship for a period of one year from the confirmed date of purchase of the original buyer and that upon written notice of any such defect, Seller will, at its option, repair or replace the defective item under the terms of this warranty, subject to the provisions and specific exclusions listed herein.

This warranty shall not apply to equipment that has been previously repaired or altered outside our plant in any way as to, in the judgment of the manufacturer, affect its reliability. Nor will it apply if the equipment has been used in a manner exceeding its specifications or if the serial number has been removed.

Seller does not assume any liability for consequential damages as a result from our product uses, and in any event our liability shall not exceed the original selling price of the equipment.

The equipment warranty shall constitute the sole and exclusive remedy of any Buyer of Seller equipment and the sole and exclusive liability of the Seller, its successors or assigns, in connection with equipment purchased and in lieu of all other warranties expressed implied or statutory, including, but not limited to, any implied warranty of merchant ability or fitness and all other obligations or liabilities of seller, its successors or assigns.

The equipment must be returned postage-prepaid. Package it securely and insure it. You will be charged for parts and labor if you lack proof of date of purchase, or if the warranty period is expired.