

NuPRO-842 Series
Full-Size PICMG 1.0
Single Board Computer
with Pentium 4 CPU
User's Guide



Recycled Paper

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Detail Description			
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Table of Contents

How to Use This Guide	iv
Chapter 1 Introduction	1
1.1 Unpacking Checklist.....	2
1.2 Features.....	3
1.3 Functional Blocks and Main Board	4
1.3.1 Intel Pentium 4 Processor.....	6
1.3.2 The Intel® 845GV Graphics Chipset Memory Controller Hub (GMCH).....	6
1.3.3 The Intel® 82801DB I/O Controller Hub 4 (ICH4)	6
1.3.4 Watchdog Timer.....	6
1.3.5 Video.....	7
1.3.6 Ethernet Interfaces.....	7
1.3.7 Serial I/O.....	7
1.3.8 IEEE-1284 Parallel Port/Printer Interface.....	7
1.3.9 Universal Serial Bus (USB).....	7
1.3.10 IDE Controller and Floppy Interface Controller	8
1.3.11 Keyboard/Mouse Controller	8
1.3.12 Software.....	8
1.4 Specifications	9
Chapter 2 Jumpers and Connectors	12
2.1 NuPRO-842 Board Outline and Illustration.....	13
2.1.1 NuPRO-842 Top View	13
2.2.1 VGA Connector.....	16
2.2.2 COM1/COM2 Pin Header.....	17
2.2.3 Gigabit Ethernet (RJ-45) Connector.....	17
2.2.4 Parallel Port Connector.....	18
2.2.5 Case Open connector	18
2.2.6 CPU Fan1/Fan2 connector	18
2.2.7 Integrated PS/2 KBD/MS connector.....	19
2.2.8 Floppy Disk connector	19
2.2.9 Primary/Secondary IDE Connector.....	20
2.2.10 Front Panel Pin Header	21
2.2.11 Mini PCI Socket	22
2.2.12 USB Connector.....	23
2.2.13 AC'97 Connector.....	23
2.2.14 USB Pin Header.....	23
2.2.15 Thermal Connector	23
2.2.16 External KB/MS Connector.....	24
2.3 NuPRO-842 Jumper Setting.....	25
2.3.1 Clear CMOS	25

2.3.2	<i>FSB Frequency</i>	26
2.3.3	<i>COM2 Function Selection</i>	26
2.3.4	<i>COM2 Mode Selection</i>	27
Chapter 3 Getting Started		28
3.1	CPU Installation	28
3.2	Memory Installation	29
3.2.1	<i>Memory Configuration Options</i>	29
3.2.2	<i>Installing Memory Modules</i>	29
3.3	Connecting IDE Devices to the NuPRO-842	30
3.4	BIOS Configuration Overview	31
3.5	Operating System Installation	32
Chapter 4 Device Driver Installation		33
4.1	Intel® 845GV Chipset	33
4.1.1	<i>System Requirements</i>	33
4.1.2	<i>Hardware Configuration File Installation</i>	34
4.2	Driver Installation	34
4.2.1	<i>VGA Driver Installation</i>	34
4.2.2	<i>LAN Driver Installation</i>	36
Chapter 5 Watchdog Timer		38
5.1	Watchdog Timer Overview	38
5.1.1	<i>Using the Watchdog in an Application</i>	39
Warranty Policy		40

How to Use This Guide

This manual is intended to assist users to configure the NuPRO-842 Full-Size PICMG 1.0 Single Board Computer with Pentium 4/Pentium 4 Mobile CPU. It is divided into 5 chapters.

Chapter 1 Introduction

Gives an overview of the product features, applications, and specifications.

Chapter 2 Connectors and Jumpers

Outlines all the connectors with pin definitions.

Chapter 3 Getting Started

Summarizes requirements to setup an operational system using the NuPRO-842. Hardware installation and BIOS overview is discuss.

Chapter 4 Driver Installation

Provides driver installation instructions.

Chapter 5 Watch Timer

Explains WDT operation.

1

Introduction

The NuPRO-842 is a full-size PICMG 1.0 Pentium 4-based Single Board Computer (SBC) with Intel 845GV chipset. It supports both PCI and ISA buses.

The CPU module supports a front side bus (FSB) of 533MHz and a maximum CPU clock of 3.06 GHz featuring 32-bit/33MHz PCI/ISA bus with up to 2GB high performance DDR host SDRAM support.

It provides standard I/Os, including RS-232, Printer Port, USB 2.0, EIDE, Ethernet, and video interfaces. The NuPRO-842 is designed to meet the needs of applications that require the highest computing performance and reliability. It is designed to run on Windows 2000/XP, Linux, etc. operating system, as well as embedded real time applications. It is the ideal solution for Telecommunications, Internet, and Industrial Networking Applications.

This chapter is designed to give you an overview of the NuPRO-842 SBC. The chapter covers the following topics:

- Unpacking and Checklist
- Features
- Specifications

1.1 Unpacking Checklist

Check the shipping carton for any damage. If the shipping carton and contents are damaged, notify the dealer for a replacement. Retain the shipping carton and packing material for inspection by the dealer. Obtain authorization before returning any product to ADLINK.

Check that the following items are included in the package, if there are any missing items, contact your dealer:

- The NuPRO-842 module (may be equipped with different speed or capacity CPU, RAM, and HDD)
- This User's Manual
- ADLINK CD
- Y Cable for PS/2 Keyboard & Mouse
- Printer Port cables with bracket
- Com cables with bracket
- USB cables with bracket
- Cooling kit
- Floppy cable
- ATA-100 Cables x 2
- CPU Cooler

Note: The NuPRO-842 OEM version package may contain a non-standard configuration, unique functionality, or different packaging according to configuration requests

CAUTION: This board must be protected from static discharge and physical shock. Never remove any of the socketed parts except at a static-free workstation. Use the anti-static bag shipped with the product to handle the board. Wear a wrist strap grounded through one of the system's ESD Ground jacks when servicing system components.



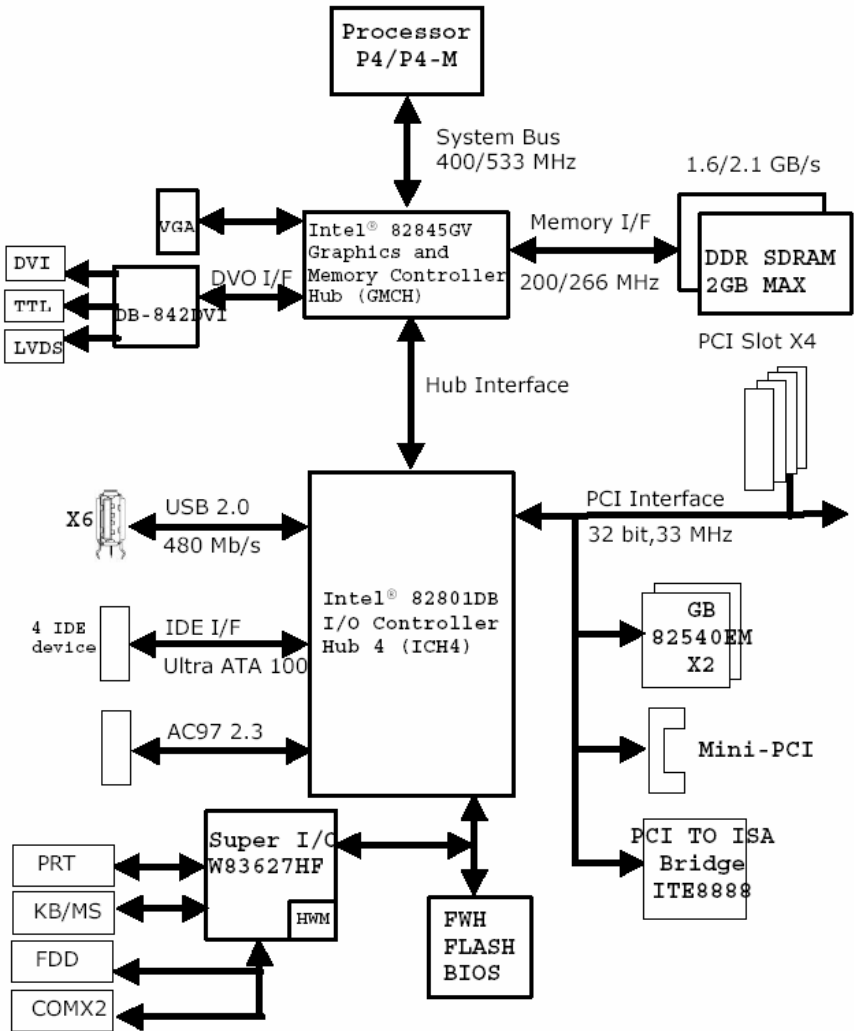
1.2 Features

- PICMG 1.0 Rev. 1.0 PCI/ISA Specification compliant.
- PCI Local Bus Specification, Rev 2.2 compliant.
- Intel mPGA478 Socket Pentium 4 FC-PGA2 CPU processor.
- Supports Front Side Bus frequency of 533/400MHz
- Two 184-pin DIMM sockets, support 144-bit, 266MHz, DDR DRAM. Supports a maximum of 2GB of memory.
- Two 10BaseT/100BaseTx/1000Base Ethernet jacks (Intel 82540EM).
- Integrated Intel Extreme Graphics supports Analog Display. Max Dynamic Video Memory 64MB (64MB if system memory is 256MB or greater, 32MB if less than 256MB).
- Supports all standard features, including VGA, serial, USB, keyboard, and mouse ports.
- Built-in system monitoring for CPU temperature, FAN speed, system temperature, CPU voltage, and DC voltages.
- Supports Intel® Pre-boot Execution Environment (PXE).

1.3 Functional Blocks and Main Board

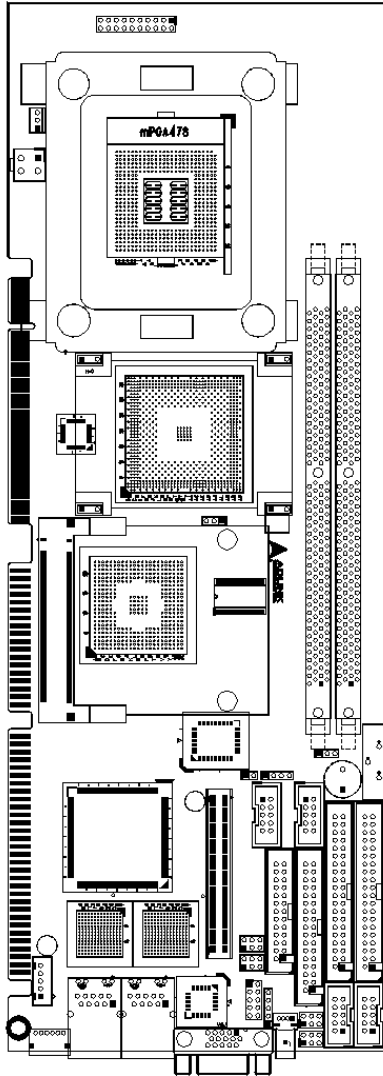
The NuPRO-842 functional block and main board diagrams are provided below:

Functional Block Diagram



Functional Block Diagram

Main Board Drawing



Main Board Drawing

1.3.1 Intel Pentium 4 Processor

The NuPRO-842 is a full-sized single board computer (SBC) that supports a single mPGA478 Intel® Pentium® 4 processor or a 478-pin Micro Flip-Chip Pin Grid Array (Micro-FCPGA) Mobile Intel® Pentium® 4 Processor – M.

The Pentium 4 processor runs at a core speed of up to 3.06GHz and the Mobile Intel® Pentium® 4 Processor – M runs at a core speed of up to 2.4Ghz. The 845GV chipset keeps the FSB operation at 400/533 MHz (auto-selected).

Intel Pentium 4 Processor and Mobile Intel Pentium 4 Processor-M have an on-die 512kB L2 Advanced Transfer Cache (ATC). The on-die cache has a 256-bit data bus from the processor core.

The design for using Pentium 4 processor required an upgraded Voltage Regulator Module circuit implementation (VRM 9.0) to handle tighter voltage tolerances.

1.3.2 The Intel® 845GV Graphics Chipset Memory Controller Hub (GMCH)

The central hub for all data passing through core system elements is through the Intel 845GV Graphics Chipset Memory Controller Hub. To balance the performance offered by the processor and memory interfaces, the GMCH allows several high-bandwidth I/O configuration options. This chipset delivers balanced, high-throughput system performance for dual processor server platforms.

1.3.3 The Intel® 82801DB I/O Controller Hub 4 (ICH4)

Connection to the MCH is done through a point-to-point Hub Interface 1.5 connection. The ICH4 provides legacy I/O interfaces through integrated features including a two-channel Ultra ATA/100 bus master IDE controller and an USB controller for two USB ports. The ICH4 also offers an integrated System Manageability Bus 2.0 (SMBus 2.0) controller, as well as a PCI 2.2-compliant interface.

1.3.4 Watchdog Timer

The watchdog timer optionally monitors system operations. It can be programmed for different timeout periods (from 1 to 255 seconds or 1 to 255 minutes). The watchdog is capable generating a Reset signal. Failure to strobe the watchdog timer within the programmed time period may result in a reset request. A register bit can be enabled to indicate if the watchdog timer caused the reset event. This watchdog timer register is cleared on power-up, enabling system software to take appropriate action if the watchdog generated the reboot.

1.3.5 Video

The NuPRO-842 provides two display ports. One analog port is output on rear IO panel. The analog port uses an integrated 350 MHz RAMDAC of the 845GV GMCH that can directly drive a standard progressive scan monitor up to a resolution of 2048x1536 pixels with 32-bit color at 60 Hz. The NuPRO-842 has a high-speed interface to a digital display use daughter board DB-842DVI. The Intel 845GV chipset implements Dynamic Video Memory Technology (DVMT) to ensure the most efficient use of system memory, allowing up to 64MB of system memory to be shared among OS, applications, and graphics display.

1.3.6 Ethernet Interfaces

The NuPRO-842 provides two 10/100/1000Mbps Ethernet ports supplied via an Intel 82540EM chip, which are connected to the 82801DB. Each Ethernet interface is routed to an RJ45/LED all in one Connector on the rear panel. Each LAN chip will be assigned a unique static MAC Address. LED drive signals for Ethernet link status and activity are routed to the same connector. The onboard Ethernet is Wired For Management 2.0 compliance. This port is available on the rear panel.

1.3.7 Serial I/O

Two serial ports are supported by the NuPRO-842. The EIA232 drivers and receivers reside on board. COM1 and COM2 are available as a 10-pin header on the motherboard. Both ports will be configured as DTE. Firmware will initialize the two serial ports as COM1 and COM2 with ISA I/O base addresses of 3F8h and 2F8h respectively. This default configuration also assigns COM1 to IRQ4 and COM2 to IRQ3. The NuPRO-842 serial controller resides in the W83627HF Super I/O device.

1.3.8 IEEE-1284 Parallel Port/Printer Interface

The parallel I/O interface signals are routed to a 26-pin connector on the board. This port supports the full IEEE-1284 specifications and provides the basic printer interface.

Firmware will initialize the parallel port as LPT1 with ISA I/O base address of 378h. This default configuration also assigns the parallel port to IRQ7. The printer interface mode (Normal, Extended, EPP, or ECP) is selectable through the BIOS SETUP utility with the W83627HF Super I/O device managing the NuPRO-842's parallel port.

1.3.9 Universal Serial Bus (USB)

NuPRO-842 supports 6 USB2.0 serial ports backward compatible to USB1.x. One USB port is on the faceplate and others with pin header. USB allows for the easy addition of peripherals such as mouse, keyboard, speakers, etc. Transfer rates up to 480Mb/s are supported. Full-speed connections

(480Mb/s) require shielded and tested cables. NuPRO-842 will provide the standard 0.5A at 5V to the peripherals.

1.3.10 IDE Controller and Floppy Interface Controller

The NuPRO-842 includes an IDE Controller (in the ICH4) and a Floppy Disk Controller (in the W83627HF). The IDE Controller provides support for internal or external IDE drives. Signals are available at the IDE connectors CN14 and CN13 and are routed to a 40-pin header. The FDD Controller provides support for an external FDD drives. Signals are available at the FDD connector CN12 and are routed to a 34-pin header.

1.3.11 Keyboard/Mouse Controller

The NuPRO-842 includes an onboard PC/AT keyboard and mouse controller. The keyboard/mouse signals are available through the PS/2 circular DIN on the panel. Both the keyboard and mouse can be connected at the same time using ADLINK's Y cable. An extra pin header connector is available for connection of an external keyboard. The NuPRO-842 keyboard/mouse controller resides in the Winbond W83627HF Super I/O device

1.3.12 Software

The NuPRO-842 is compatible with all major PC operating systems. ADLINK provides support for many popular operating systems, including additional drivers for ADLINK peripherals. Software device drivers for the NuPRO-842 may be found on the ADLINK CD.

1.4 Specifications

Compliant Specifications

- PICMG 1.0 Rev. 1.0 PCI-ISA Specification compliant
- PCI Local Bus Specification, Rev 2.2 compliant

Form Factor

- Full-Size Single Board Computer, 388mm x 122mm (15.2"x4.8")

CPU/Cache

- Single mPGA478 Intel Pentium 4 processor or a 478-pin Micro Flip-Chip Pin Grid Array (Micro-FCPGA) Mobile Intel Pentium 4 Processor – M
- Intel Pentium 4 Processor and Mobile Intel Pentium 4 Processor-M have an on-die an on-die 512KB L2 Advanced Transfer Cache (ATC). The on-die cache has a 256-bit data bus from the processor core

Chipset

- Intel 82845GV Graphics Memory Control Hub (GMCH)
- Intel 82801DB I/O Control Hub 4 (ICH4)

Host Memory

- Two DDR DIMM sockets
- Unbuffered, unregistered 184-pin non-ECC DDR SDRAM
- Supports up to 2GB

BIOS

- Supports 4/8 Mbit Firmware Hub 82802AB(4Mb) or SST49LF004A
- Boot block, PNP, DMI, Write Protection and field upgradeable

Gigabit Ethernet

- Two Gigabit Ethernet ports with an Intel 82540EM Ethernet controller
- Support 1000Base-T, 100Base-TX and 10Base-T (IEEE 802.3, 802.3u, and 802.3ab).
- IEEE802.3x compliant flow control, supports auto-negotiation and link setup
- Speed and Link LEDs on the RJ-45 connector

Graphic Display

- Integrated Intel Extreme Graphics supports Analog Display and DVI Interface with daughter board "DB-842DVI"
- Max dynamic video memory 64MB (If system memory is less than 256MB, then only 32MB can be allocated as video memory)

USB Interface

- Six USB 2.0 ports, one on faceplate, others with pin header
- USB ports provide 0.5A @ 5V power for peripheral devices with over current protection

IDE Ports

- Bus master IDE controller supports two ultra ATA-100 / 66 / 33 interfaces

Super I/O and WDT

- Winbond W83627HF
- Two 16C550 UART compatible RS-232 COM ports, Com2 support RS-232/RS-422/485/485+.
- PS2 keyboard and mouse supported.
- W82782D built-in, monitoring CPU temperature, fan speed, system temperature, CPU voltage, and DC voltages.
- Watchdog timer: Programmable I/O port on addresses 02Eh and 02FH. Programmable timer for 1-255 seconds or 1-255 minutes. Easy-programming libraries for DOS, Windows 95/98/NT are included.

OS Compatibility

- Microsoft® Windows 2000, Windows XP, Red Hat Linux
- Other OS support available upon request.

Environment

- Operating temperature: 0 - 60 °C (with proper airflow and active heatsink)
- Storage temperature: -40 - 85 °C
- Humidity: 5% - 95% non-condensed
- Shock: 30G peak-to-peak, 10 ms, non-operation
- Vibration:
 - ✓ Non-operation: 6G, 10-1000 Hz, random
 - ✓ Operation: 0.5G, 510-1000 Hz, random

Safety Certifications

- CE certified
- FCC Part 15 class
- UL-1950, CSA-950, and VDE EN 60 950/IE950

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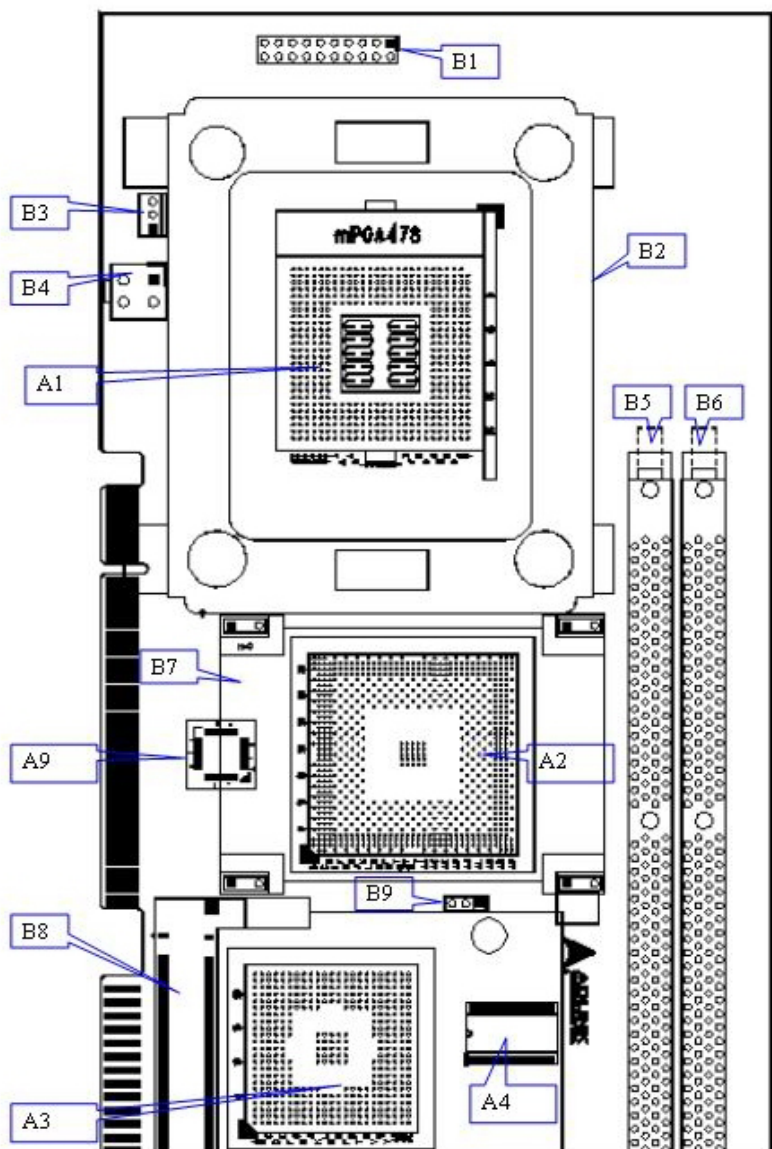
Jumpers and Connectors

This chapter will familiarize users with the NuPRO-842 interfaces and connections available before getting started. It will provide information about the board layout, connector definitions, and jumper setup, including the following information:

- NuPRO-842 board outline and illustration
- NuPRO-842 connectors pin assignments
- NuPRO-842 jumpers setting

2.1 NuPRO-842 Board Outline and Illustration

2.1.1 NuPRO-842 Top View



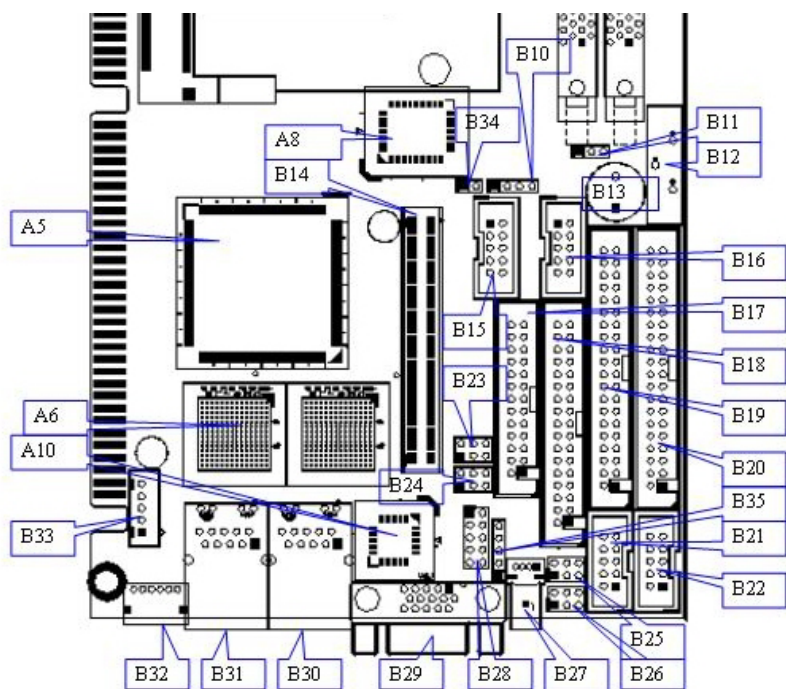
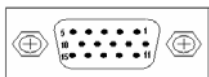


Figure 3: NuPRO-842 Top View

A1	U21	CPU P4/P4-M
A2	U19	GMCH 82845GV
A3	U13	ICH4 FW82801DB
A4	U14	Clock Generator
A5	U9	PCI to ISA Bridge IT8888
A6	U2	Intel GB Ethernet 82540EM
A7	U3	Intel GB Ethernet 82540EM
A8	U10	Firmware Hub
A9	U15	842PLD
A10	U1	RS422/RS485 PLD
B1	CN23	ATX Power CONNECTOR
B2	U21	CPU HEATSINK SKT
B3	FN1	CPU FAN

B4	CN21	CPU POWER CONNECTOR
B5	DIMM1	DDR DIMM SOCKET
B6	DIMM2	DDR DIMM SOCKET
B7	U19	GMCH HEATSINK
B8	CN19	MINI PCI CONNECTOR
B9	JP8	FSB FREQUENCY SELECTION JUMPER
B10	JP5	EXTERNAL USB PIN HEADER
B11	JP6	CLEAR CMOS JUMPER
B12	BT1	CR2032 BATTERY HOLDER
B13	BZ1	BUZZER
B14	CN15	DB-842DVI CNN
B15	CN16	USB2.0 BOX HEADER
B16	CN18	USB2.0 BOX HEADER
B17	CN7	PRINTER PORT
B18	CN12	FLOPPY
B19	CN13	PRIMARY IDE
B20	CN14	SECONDARY IDE
B21	CN10	COM1
B22	CN11	COM2
B23	JP4	
B24	JP3	COM2 SETTING JUMPER
B25	JP2	
B26	JP1	
B27	CN9	USB2.0 CNN
B28	CN8	AC'97 CNN
B29	CN3	VGA CNN
B30	CN6	GB CNN
B31	CN5	GB CNN
B32	CN1	KB/MS COMBO
B33	CN2	EXTERNAL KB CNN
B34	CN17	EXTERNAL THERMAL CNN
B35	CN4	IRDA CNN

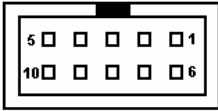
2.2.1 VGA Connector



Signal Name	Pin	Pin	Signal Name
Red	1	2	Green
Blue	3	4	N.C.
GND	5	6	GND
GND	7	8	GND
+5V	9	10	GND
N.C.	11	12	DDCDAT
HSYNC	13	14	VSYNC
DDCCLK	15		

VGA Connector Pin Definition

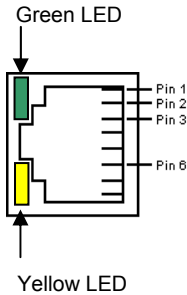
2.2.2 COM1/COM2 Pin Header



PIN	SIGNAL	FUNCTION
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 Indicate
10	NC	No Connect

COM1/ COM2 Pin Definition

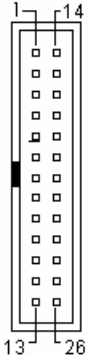
2.2.3 Gigabit Ethernet (RJ-45) Connector



PIN	LAN1 SIGNAL	LAN2 SIGNAL	FUNCTION
1	LAN1_TDP1	LAN2_TDP1	Transmit Data1 +
2	LAN1_TDN1	LAN2_TDN1	Transmit Data1 -
3	LAN1_RDP2	LAN2_RDP2	Receive Data2 +
4	LAN1_RDP3	LAN2_RDP3	Receive Data3 +
5	LAN1_RDN3	LAN2_RDN3	Receive Data3 -
6	LAN1_RDN2	LAN2_RDN2	Receive Data2 +
7	LAN1_TDP4	LAN2_TDP4	Transmit Data4 +
8	LAN1_TDN4	LAN2_TDN4	Transmit Data4 -

Ethernet Connector Pin Definition

2.2.4 Parallel Port Connector



Signal Name	Pin #	Pin #	Signal Name
Line printer strobe	1	14	AutoFeed
PD0, parallel data 0	2	15	Error
PD1, parallel data 1	3	16	Initialize
PD2, parallel data 2	4	17	Select
PD3, parallel data 3	5	18	Ground
PD4, parallel data 4	6	19	Ground
PD5, parallel data 5	7	20	Ground
PD6, parallel data 6	8	21	Ground
PD7, parallel data 7	9	22	Ground
ACK, acknowledge	10	23	Ground
Busy	11	24	Ground
Paper empty	12	25	Ground
Select	13	N/A	N/A

Parallel Connector Pin Definition

2.2.5 Case Open connector

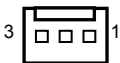
Signal is connected to a limit switch sensor of the chassis to detect if the case is opened or closed.



PIN	SIGNAL	FUNCTION
1	CASEOPEN#	Case Open Signal
2	GND	Ground

Case Open connector Pin Definition

2.2.6 CPU Fan1/Fan2 connector

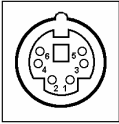


Pin #	Signal Name
1	GND
2	Fan power
3	Fan speed

Fan1/Fan2 Connector Pin Definition

2.2.7 Integrated PS/2 KBD/MS connector

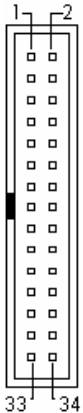
Both the keyboard and mouse can be connected at the same time using an ADLINK Y cable.



PIN	SIGNAL	FUNCTION
1	KBDAT	Keyboard Data
2	MSDAT	Mouse Data
3	GND	Ground
4	KBMS5V	Power
5	KBCLK	Keyboard Clock
6	MSCLK	Mouse Clock

PS/2 Keyboard & Mouse Connector Pin definition

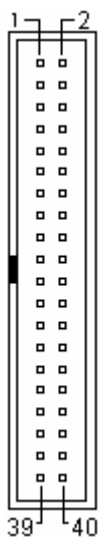
2.2.8 Floppy Disk connector



Pin	Function	Pin	Function
1	Ground	2	Extended Density
3	Ground	4	No Connect
5	-	6	Data Rate
7	Ground	8	Index
9	Ground	10	Motor A Select
11	Ground	12	Drive B Select
13	Ground	14	Drive A Select
15	Ground	16	Motor B Select
17	Ground	18	Step Direction
19	Ground	20	Step Pulse
21	Ground	22	Write Data
23	Ground	24	Write Gate
25	Ground	26	Track 0
27	Ground	28	Write Protect
29	Ground	30	Read Data
31	Ground	32	Side 1
33	Ground	34	Disk Change

Floppy Connector Pin Definition

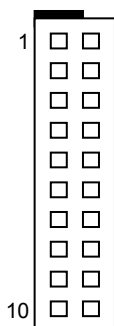
2.2.9 Primary/Secondary IDE Connector



Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	N.C
DRQ0 / DRQ1	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK0 / DACK1	29	30	Ground
IRQ14 / IRQ 15	31	32	No connect
Address 1	33	34	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground

IDE Connector Pin Definition

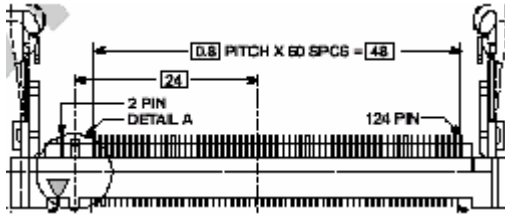
2.2.10 Front Panel Pin Header



PIN	SIGNAL	FUNCTION	PIN GROUP
1	+5V	Power	Power LED
2	WDTLED#	Watch Dog LED Signal	
3	PLED	Power LED Signal	
4	KEYLOCK	Keyboard lock	Key Lock
5	GND	Ground	
6	GND	Ground	ATX Power Connector
7	NC	No connect	
8	PWRON	Power-on signal	
9	+5VSB	Standby Power	
10	PME#	Power Management Event	
11	WDSPK	Speaker signal	Chassis Speaker
12	NC	No connect	
13	NC	No connect	
14	+5V	Power	
15	RESETBT	RESET Button signal	RESET button
16	GND	Ground	
17	HDDLED	Hard Disk LED signal	Hard Disk LED
18	+5V	Power	
19	PWRBT	POWER Button signal	Power on button
20	GND	Ground	

Front Panel Pin Definition

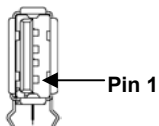
2.2.11 Mini PCI Socket



PIN	SIGNAL	PIN	SIGNAL	PIN	SIGNAL	PIN	SIGNAL
1	NC	2	NC	63	+3.3V	64	FRAME#
3	NC	4	NC	65	CLKRUN#	66	TRDY#
5	NC	6	NC	67	SERR#	68	STOP#
7	NC	8	NC	69	GND	70	+3.3V
9	NC	10	NC	71	PERR#	72	DEVSEL#
11	NC	12	NC	73	C/BE[1]	74	GND
13	NC	14	NC	75	AD[14]	76	AD[15]
15	GND	16	EX_INTC#	77	GND	78	AD[13]
17	INTB#	18	+5V	79	AD[12]	80	AD[11]
19	+3.3V	20	INTA#	81	AD[10]	82	GND
21	EX_CLK	22	EX_INTD#	83	GND	84	AD[9]
23	GND	24	+3.3VS	85	AD[8]	86	C/BE[0]
25	CLK	26	RESET#	87	AD[7]	88	+3.3V
27	GND	28	+3.3V	89	+3.3V	90	AD[6]
29	REQ#	30	GNT#	91	AD[5]	92	AD[4]
31	+3.3V	32	GND	93	EX_GNT#	94	AD[2]
33	AD[31]	34	PME#	95	AD[3]	96	AD[0]
35	AD[29]	36	EX_REQ#	97	+5V	98	SMBCLK
37	GND	38	AD[30]	99	AD[1]	100	SMBDATA
39	AD[27]	40	+3.3V	101	GND	102	GND
41	AD[25]	42	AD[28]	103	AC_SYNC	104	GND
43	EX_IDSEL#	44	AD[26]	105	AC_SDIN	106	AC_SDOUT
45	C/BE[3]	46	AD[24]	107	AC_BITCLK	108	AC_ID0#
47	AD[23]	48	IDSEL#	109	AC_ID1#	110	AC_RST#
49	GND	50	GND	111	NC	112	NC
51	AD[21]	52	AD[22]	113	NC	114	GND
53	AD[19]	54	AD[20]	115	NC	116	NC
55	GND	56	PAR	117	NC	118	NC
57	AD[17]	58	AD[18]	119	NC	120	NC
59	C/BE[2]	60	AD[16]	121	NC	122	MPCIACT#
61	IRDY#	62	GND	123	+5Analog	124	+3.3VS

Mini PCI Socket Pin Definition

2.2.12 USB Connector



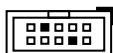
PIN	SIGNAL	FUNCTION
1	VCC	Power
2	USB -	Data (-)
3	USB +	Data (+)
4	GND	Ground

2.2.13 AC'97 Connector



PIN	SIGNAL	FUNCTION	PIN	SIGNAL	FUNCTION
1	GND	Ground	2	AC_BITCLK	Bit Clock
3	GND	Ground	4	AC_SDIN0	Data Input 0
5	+5V	Power	6	AC_SDOOUT	Data Output
7	AC_SDIN2	Data Input 2	8	AC_SDIN1	Data Input 1
9	AC_SYNC	Synchro-signal	10	AC_RSTJ	Reset

2.2.14 USB Pin Header



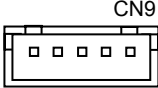
PIN	SIGNAL	FUNCTION	PIN	SIGNAL	FUNCTION
1	VCC	Power	2	GND	Ground
3	USB -	Data (-)	4	NC	Empty
5	USB +	Data (+)	6	USB +	Data (+)
7	NC	Empty	8	USB -	Ground
9	GND	Ground	10	VCC	Ground

2.2.15 Thermal Connector



PIN	SIGNAL	FUNCTION
1	TGND	Thermal Ground
2	VTIN	Thermal Voltage Input

2.2.16 External KB/MS Connector



CN9

PIN	SIGNAL	FUNCTION	COMMENTS
1	KBCLK	Keyboard Data	Keyboard / Mouse Combine Interface
2	KBDATA	Mouse Data	
3	NC	Ground	
4	GND	Power	
5	+5V	Keyboard Clock	


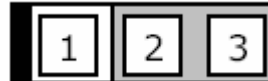
2.3 NuPRO-842 Jumper Setting

The NuPRO-842 is designed for maximum flexibility with as few jumpers as possible. Most of the configuration options can be selected through the BIOS menu. However, some options still need to be configured by jumpers.

Description	Location
Clear CMOS	JP6
FSB Frequency Selection	JP8
COM2 Function Selection	JP1-3
COM2 RS-485+ Function Selection	JP4

Jumpers Definition on PXI-3710

2.3.1 Clear CMOS

RTC status	JP6	NuPRO-842 JP6
Normal	1-2	
Clear CMOS	2-3	


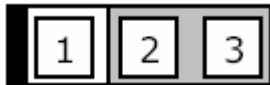
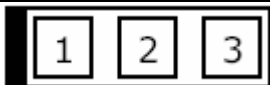
Clear CMOS RTC RAM

The CMOS RAM data for real time clock (RTC) contains the date / time and password information. The button cell battery powers the CMOS when the system is powered off.

To erase the CMOS RAM data:

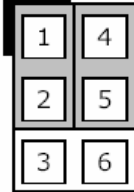
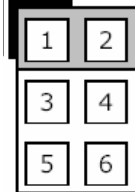
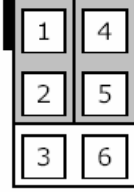
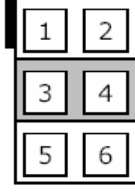
1. Shut down the system.
2. Short pins 1 and 2 of JP6. Then, replace the jumper back to normal operation position.
3. Turn the power on.

2.3.2 FSB Frequency

FSB Frequency	JP8	NuPRO-842 JP8
Auto	1-2	
400 MHZ	2-3	
533 MHZ	NC	

The NuPRO-842 will automatically detect Front Side Bus speed, or you can manually force it with jumper JP8.

2.3.3 COM2 Function Selection

FUNCTION	JP1 JP2	JP3	Jumper Setting
RS-232	1-2 4-5	1-2	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>JP1</p>  </div> <div style="text-align: center;"> <p>JP3</p>  </div> </div>
RS-422	1-2 4-5	3-4	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>JP1</p>  </div> <div style="text-align: center;"> <p>JP3</p>  </div> </div>

RS-485	2-3 5-6	5-6	
--------	------------	-----	--

COM2 is configurable to act in accordance with the following standards: RS-232, RS-422, and RS-485. Use jumpers J1, J2, and J3 to adjust as needed.

2.3.4 COM2 Mode Selection

Mode	JP4	Jumper Setting
RS-422 / RS-485	1-2 4-5	
RS-485+	2-3 5-6	

The mode of COM2 can be changed using jumper JP4.

3

Getting Started

This chapter gives a summary of what is required to setup an operational system using the NuPRO-842. Hardware installation and BIOS overview is discuss.

3.1 CPU Installation

The NuPRO-842 CPU module supports a single Intel mPGA478 Pentium 4 processor or 478-pin Micro Flip-Chip Pin Grid Array (Micro-FCPGA) Pentium 4 Processor-M. Users need to install a highly efficient CPU fan/cooler to guarantee the system stability.

To install the CPU follow the steps carefully:

1. Lift the lever on the CPU socket.
2. Insert the CPU in the socket, making sure that pin 1 of the CPU aligns with pin 1 of the socket (marked with a triangle). Press the lever down until you hear it “click” into the locked position.
3. Apply the proper amount of thermal compound to the CPU die and place the heatsink and fan on top of the CPU.
4. Connect the three wires of the CPU fan to the respective CPU fan connector.

Note: Ensure that the CPU heat sink and the CPU top surface are in tight contact to avoid CPU overheating problems that can cause the system to hang or crash. The CPU heat sink and fan should be installed tightly together. Please contact an ADLINK dealer for suitable heat sink and fan assemblies

3.2 Memory Installation

This section details the procedure for installing system memory on the NuPRO-842. Correct memory configuration is critical for proper system operation.

3.2.1 Memory Configuration Options

The NuPRO-842 has flexible memory configuration options, including support for 64MB, 128MB, 256MB, 512MB, and 1GB modules. Note that the modules must all be the same type and density and must be installed in pairs and if only one pair of DIMM modules is used, populate DM1 and DM2 first.



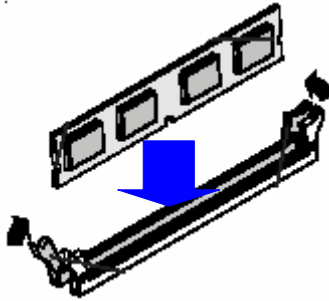
DIMM Sockets

3.2.2 Installing Memory Modules

Installing DIMM modules is simple. The modules are inserted in the sockets and are held in place by the socket retaining arms. The edge connectors on the modules are of different widths and there are key notches in each module. This ensures that you cannot insert a module incorrectly.

Before you install any modules, you should choose a configuration. You should then prepare the required number and type of DDR modules.

To install either type of module follow these procedure:



Inserting DIMM into Socket

1. Align the module to the socket so that the edge connectors on the module match the socket sections.
2. Hold the module perpendicular to the motherboard and press the edge connector into the socket.
3. Press the module fully into the socket so that the socket retaining arms swing up and engage the retention notches at each end of the module.
4. Following the configuration you have chosen, repeat this procedure if necessary so that all modules are installed.
5. Once the modules are installed, system memory installation is complete.

3.3 Connecting IDE Devices to the NuPRO-842

The NuPRO-842 supports two IDE channels, Primary and Secondary. It has two IDE device connectors onboard which support IDE devices running in any data transfer mode up to ATA-100. Each IDE connector supports two drives, a Master and a Slave. The drives connect to the NuPRO-842 with an IDE ribbon cable.

To install an IDE drive, connect the drive to one of the drive connectors to a suitable ribbon cable. Plug the board end of the cable into one of the IDE connectors on the NuPRO-842. Make sure pin 1 of the ribbon cable connector is properly aligned with pin 1 of the IDE device connector.

3.4 BIOS Configuration Overview

The BIOS has many separately configurable features. These features are selected by running the built-in Setup utility. System configuration settings are saved in a portion of the battery-backed RAM in the real-time clock device and are used by the BIOS to initialize the system at boot-up or reset. The configuration is protected by a checksum word for system integrity.

To access the Setup utility, press the "Del" key during the system RAM check at boot time. When Setup runs, an interactive configuration screen displays.

Setup parameters are divided into different categories. The available categories are listed in menus. The parameters within the highlighted (current) category are listed in the bottom portion of the Setup screen. Context sensitive help is displayed in the right portion of the screen for each parameter.

Use the arrow keys to select a category from the menu. To display a submenu, highlight the category and then press the "Enter" key.

For more detailed information about the BIOS and other utilities, see the BIOS Manual.

3.5 Operating System Installation

For more detailed information about your operating system, refer to the documentation provided by the operating system vendor.

Install peripheral devices. CompactPCI devices are automatically configured by the BIOS during the boot sequence.

Most operating systems require initial installation on a hard drive from a floppy or CDROM drive. These devices should be configured, installed, and tested with the supplied drivers before attempting to load the new operating system.

Read the release notes and installation documentation provided by the operating system vendor. Be sure to read any *README* files or documents provided on the distribution disks, as these typically note documentation discrepancies or compatibility problems.

Select the appropriate boot device order in the SETUP boot menu depending on the OS installation media used. For example, if the OS includes a bootable installation floppy, select Floppy as the first boot device and reboot the system with the installation floppy installed in the floppy drive. (Note that if the installation requires a non-bootable CD-ROM, it is necessary to boot an OS with the proper CD-ROM drivers in order to access the CD-ROM drive).

Proceed with the OS installation as directed, being sure to select appropriate device types if prompted. Refer to the appropriate hardware manuals for specific device types and compatibility modes of ADLINK NuPRO products.

When installation is complete, reboot the system and set the boot device order in the SETUP boot menu appropriately.

4

Device Driver Installation

To install drivers for the NuPRO-842, refer to the installation information in this chapter. Basic driver installation information for Windows 98/ME/NT4.0/2000/XP are outlined in this section. For installation information for non-Windows Operating Systems, refer to the extensive explanation in the ADLINK CD. The drivers are located in the following directories of the CD-ROM:

Chipset driver	\CHIPDRV\Chipset\I845GV
LAN relative driver	\CHIPDRV\LAN\82540EM
Watchdog relative library	\CHIPDRV\WDT\dos\NP842
VGA Driver	\CHIPDRV\CHIPDRV\I845GV

4.1 Intel® 845GV Chipset

This section describes the installation procedure for the Intel 845GV chipset device driver under Windows 2000/XP.

4.1.1 System Requirements

One of the following operating systems must be fully installed on the system before installing any other driver, utilities or software:

- Windows* 98 4.10.1998 (Original Release)
- Windows* 98 SE 4.10.2222 (Original Release)
- Windows* Me 4.90.3000 (Original Release)
- Windows* 2000 5.00.2195 (Original Release)
- Windows* XP 5.10.2600 (Original Release)

4.1.2 Hardware Configuration File Installation

This section describes how to install the hardware configuration files into a system operating Windows 98/ME/2000/XP.

Note: Record the location of the Windows 98/ME/2000/XP directory before installing the driver.

1. Check the System Requirements. Windows 98/ME/2000/XP must be fully installed and running on the system prior to running this software.
2. Close any running applications.
3. The files are stored in an integrated application setup program. This program is designed for a Windows 98/ME/2000/XP program that allows the INF files to be installed.
4. Locate the directory `X:\CHIPDRV\Chipset\I845GV` in the CD-ROM, and then Run `Setup.exe`.
5. Click **'Next'** on the *Welcome* screen to read and agree to the license agreement. Click **Yes** if you agree to continue. NOTE: If you click **No**, the program will terminate.
6. Click **'Next'** on *Readme Information* screen to install INF files.
7. Click **'Finish'** and restart the system when prompted.
8. Follow the screen instructions and use the default settings to complete the setup when Windows restarts. Upon restarting, Windows will display that it has found new hardware and is installing drivers. If the *New Hardware Found* dialog box is displayed requesting the location of the drivers, use the mouse to click on the scrollbar and click on the <Windows directory>.
9. Select **Yes**, when prompted to restart Windows.

4.2 Driver Installation

4.2.1 VGA Driver Installation

This section provides information on how to install the VGA driver. Please follow the instructions carefully.

Installing Drivers for Windows 98/ME/NT/2000/XP

The following section describes the normal display driver installation procedures for Windows 98/ME/NT/2000/XP.

Installing the Drivers for Windows 98/ME

1. Boot Windows 98/ME.
2. The driver is included in the ADLINK CD. Run `win9x131.exe` under the directory: `X:\CHIPDRV\VGA\I845GV`.
3. Click **Next>** on *Welcome* screen. And select **Typical** on *Setup Type* screen and click **Next>**.
4. Use default program folders on *Select Program Folder* screen. Click **Next>** to install driver. Finally, click **Finish** to re-start.

Installing the Drivers for Windows NT 4.0

1. Boot Windows NT 4.0.
2. The driver is included in the ADLINK CD. Run `winnt4131.exe` under the directory: `X:\CHIPDRV\VGA\I845GV`.
3. Click **Next>** on *Welcome* screen. And select **Typical** on *Setup Type* screen and click **Next>**.
4. Use default program folders on *Select Program Folder* screen. Click **Next>** to install driver. Finally, click **Finish** to re-start.

IMPORTANT: Install the Windows NT 4.0 with at least Service Pack 4 (version number: 4.00.1381) first before installing the VGA driver. If Windows NT 4.0 Service Pack 4 is not installed, please contact your software vendor or download it from the Microsoft web site.

Installing the Drivers for Windows 2000/XP

1. Boot Windows 2000/XP.
2. The driver is included in the ADLINK CD. Run the `win2k_xp131.exe` under the directory: `X:\CHIPDRV\VGA\I845GV`.
3. Click **Next>** on *Welcome* screen. And select **Typical** on *Setup Type* screen and click **Next>**.
4. Use default program folders on *Select Program Folder* screen. Click **Next>** to install driver. Finally, click **Finish** to re-start.

4.2.2 LAN Driver Installation

This section describes the LAN driver installation for the onboard Ethernet controllers, the **Intel 82540EM**. The relative drivers are located in the following directory of the ADLINK CD: X:\CHIPDRV\LAN.

The Intel LAN drivers supports the following OS or platforms: Windows 98 SE, Windows ME, Windows NT 4.0, Windows 2000, Windows XP, and Linux

All the above drivers are included in the ADLINK CD. Driver Installation information for Windows systems is included below. For LAN driver installation of other OS's, please refer to the readme file in the CD.

Driver Installation on Windows 2000/XP

Windows 2000 may automatically try to install a LAN driver within its directory. We recommend that users manually install the latest LAN driver, which comes with the ADLINK CD to guarantee compatibility. After installing Windows 2000, please update to the new drivers by following these procedures.

1. Boot Windows 2000.
2. The driver is included in the ADLINK CD. Run `Setup.exe` under the directory: X:\CHIPDRV\LAN\82540EM\pro2kxpm.
3. Click the **Install now** button on the *Installation instructions* screen to install the drivers.
4. Click **Finish** button to finish the installation.

Driver Installation on Windows 98/98SE/ME

Windows 98 will install the LAN drivers automatically. We recommend that users manually update the LAN drivers, which come with the ADLINK CD to guarantee compatibility. After installing Windows 98, please update to the new drivers by following these procedures.

1. Boot Windows 98.
2. The driver is included in the ADLINK CD. Run the `Setup.exe` under the directory: X:\CHIPDRV\LAN\82540EM\pro98mem.
3. Click the **Install now** button on the *Installation instructions* screen to install the drivers.
4. Click **Finish** button to finish the installation.

Driver Installation on Windows NT

Windows NT may ask to install a LAN driver from its own library of drivers. We recommend that users manually update the LAN drivers, which come with the ADLINK CD to guarantee compatibility. After installing Windows NT, please update to the new driver by following these procedures.

1. Boot Windows NT.
2. The driver is included in the ADLINK CD. Run the `Setup.exe` under the directory: `X:\CHIPDRV\LAN\82540EM\pront4`
3. Click the ***Install now*** button on the *Installation instructions* screen to install the drivers.
4. After installing, click the ***Restart now*** button to restart the system.

5

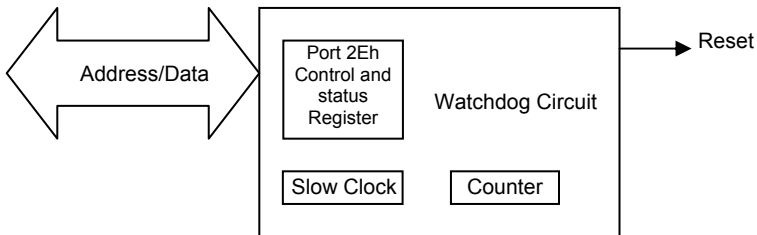
Watchdog Timer

This chapter explains the operation of the NuPRO-842 watchdog timer. It provides an overview of watchdog operations and features. Sample programs are located at `X:\CHIPDRV\WDT\DOS\NP842`.

5.1 Watchdog Timer Overview

The primary function of the watchdog timer is to monitor the NuPRO-842 operation and to reset the system if the software fails to function as programmed. The major features of the watchdog timer are:

- Enabled and disabled through software control
- Armed and strobed through software control



Watchdog Timer Architecture

The NuPRO-842 custom watchdog timer circuit is implemented in a programmable logic device. The watchdog timer contains two "Control and Status Registers."

- The watchdog times out after a selected timeout interval.
- A hard reset occurs.

The timeout period is 1 – 255 seconds or 1 – 255 minutes.

5.1.1 Using the Watchdog in an Application

The following topic is provided to help users learn how to use the watchdog in an application. The watchdog reset function is also described. The watchdog reset is controlled through the watchdog "Control and Status Registers."

Watchdog Reset

An application using the reset feature enables the watchdog reset, sets the terminal count period, and periodically strobes the watchdog to keep it from resetting the system. If a strobe is missed, the watchdog times out and resets the system hardware.

For a detailed programming sample, please refer to the sample code provide with the CD-ROM located at X:\CHIPDRV\WDT

Warranty Policy

Thank you for choosing ADLINK. To understand your rights and enjoy all the after-sales services we offer, please read the following carefully:

1. Before using ADLINK's products please read the user manual and follow the instructions exactly.
2. When sending in damaged products for repair, please attach an RMA application form.
3. All ADLINK products come with a two-year guarantee, repaired free of charge.
 - The warranty period starts from the product's shipment date from ADLINK's factory.
 - Peripherals and third-party products not manufactured by ADLINK will be covered by the original manufacturers' warranty.
 - End users requiring maintenance services should contact their local dealers. Local warranty conditions will depend on local dealers.
4. This warranty will not cover repair costs due to:
 - a. Damage caused by not following instructions.
 - b. Damage caused by carelessness on the users' part during product transportation.
 - c. Damage caused by fire, earthquakes, floods, lightening, pollution, other acts of God, and/or incorrect usage of voltage transformers.
 - d. Damage caused by unsuitable storage environments (i.e. high temperatures, high humidity, or volatile chemicals).
 - e. Damage caused by leakage of battery fluid.
 - f. Damage from improper repair by unauthorized technicians.
 - g. Products with altered and/or damaged serial numbers.
 - h. Other categories not protected under our guarantees.
5. Customers are responsible for shipping costs to transport damaged products to our company or sales office.

6. To ensure the speed and quality of product repair, please download a RMA application form from our company website: www.adlinktech.com. Damaged products with attached RMA forms receive priority.

For further questions, please contact our FAE staff.

ADLINK: service@adlinktech.com