NuPRO-825

PICMG 1.0 Half-Size

Pentium M SBC

User's Manual

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1 Introduction

The NuPRO-825 single board computer is comprised of the ProCB-825, a PICMG 1.0 compliant half-size single carrier board, and the EM-64 CPU module. It features a single Intel® Pentium® M processor with 1MB L2 cache in a 478-pin Micro-FCPGA package, and is validated with the Intel® 855GME chipset that supports PC2100/2700 (266/333 MHz) ECC DDR SODIMM 72-bit memory up to a maximum of 2GB.

The EM-64 CPU module is a 112.4 x 94mm embedded form factor CPU module that incorporates the 855GME Graphics Memory Controller Hub (GMCH) northbridge. By separating the northbridge and southbridge between the EM-64 CPU module and ProCB-825 carrier board, the NuPRO-825 is designed to facilitate speedy development of semi-custom designs.

The ProCB-825 carrier board is equipped with the Winbond 83627HF Super I/O. It also includes common PC peripheral I/O interfaces such as serial and parallel ports, keyboard/mouse, Gigabit Ethernet (NuPRO-825DV), IDE, and VGA.

The ProCB-825 carrier board and EM-64 CPU module are connected by a proprietary high-speed interface that links the CPU and northbridge on the CPU module to the southbridge on the carrier board. It also connects the display signals such as analog RGB, LVDS, and DVI signals from the northbridge to the ProCB-825.

The NuPRO-825 is designed to support the following operating systems: Windows XP, Windows 2000, and Linus Fedora Core 3.

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1.1 NuPRO-825 Block Diagram

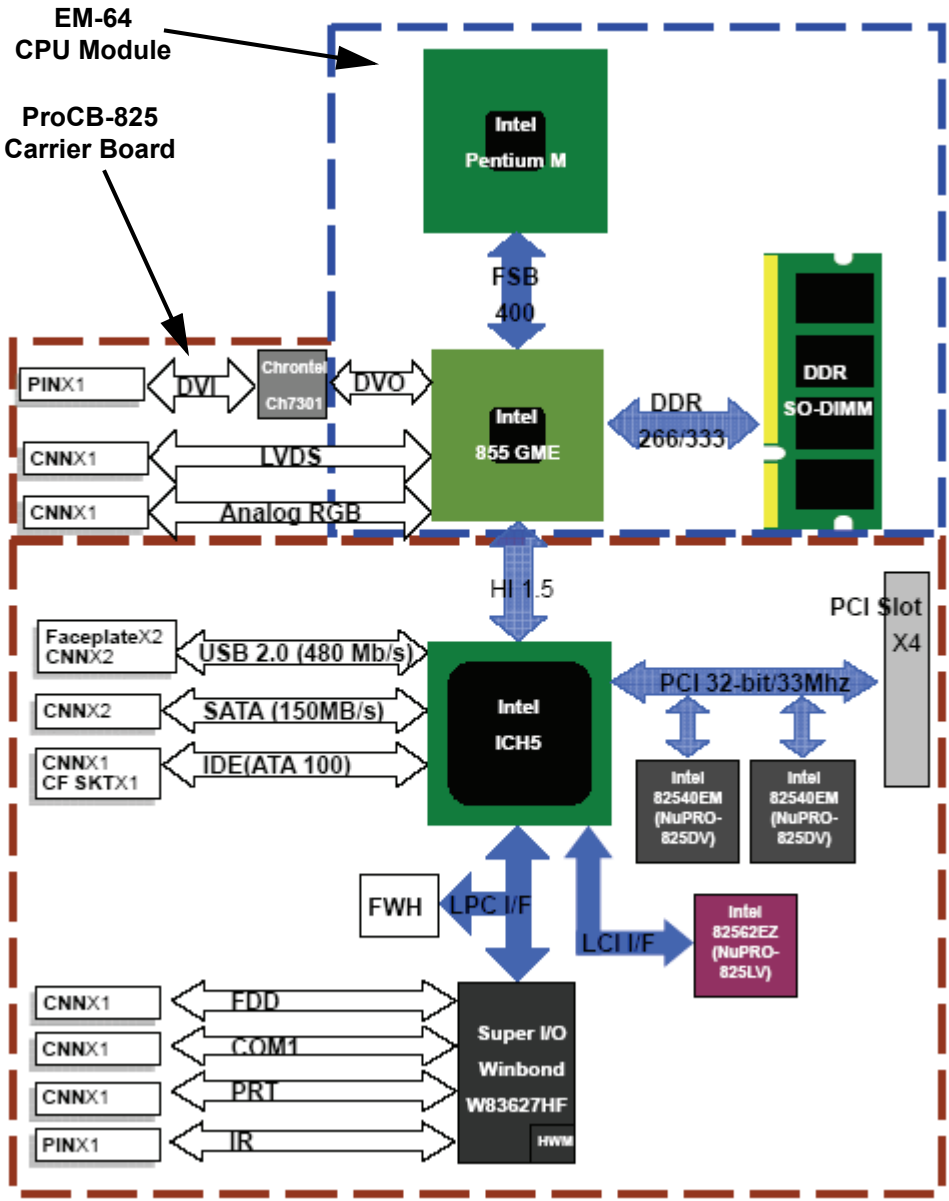


Figure 1-1: NuPRO-825 Block Diagram

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1.2 EM-64 CPU Module Features

The ADLINK EM-64 CPU uses an Intel® Pentium® M processor and is specifically designed for embedded, fanless applications. The EM-64 and ProCB-825 are connected by a proprietary high-speed interface which provides:

1. High-speed bus between northbridge 855GME and south bridge ICH5
2. Analog RGB, LVDS, and DVI interfaces for different displays are used. Main features of EM-64:

The following is a list of the EM-64's key features:

- A single high performance, low power Intel® Pentium® M processor with 1MB L2 cache in Micro-FCPGA packages (up to 2.0GHz).
  - Supports Intel® Architecture with Dynamic Execution.
  - High performance, low-power core.
  - On-die, primary 32-KB instruction cache and 32-KB write-back data cache.
  - On-die, 1-MB second level cache with Advanced Transfer Cache Architecture.
  - 400-MHz, Source-Synchronous processor system bus.
- 855GME Graphics Memory Controller Hub (GMCH) northbridge.
- Supports up to two double-sided SODIMMs (four rows populated) with unbuffered PC2100/PC2700 DDR-SDRAM with or without ECC (64-bit data interface with non-ECC SODIMM, 72-bit with ECC SODIMM).
- Supports 64 Mb, 128 Mb, 256 Mb, and 512 Mb technologies for x8 and x16 width devices.
- Supports analog display (RGB) up to 1600 x 1200 at 85Hz, 2048 x 1536 at 75Hz; and digital display (DVO) up to 1600 x 1200 at 85Hz.
- Up to 32MB of dynamic video memory allocation
- CPU temperature monitoring.

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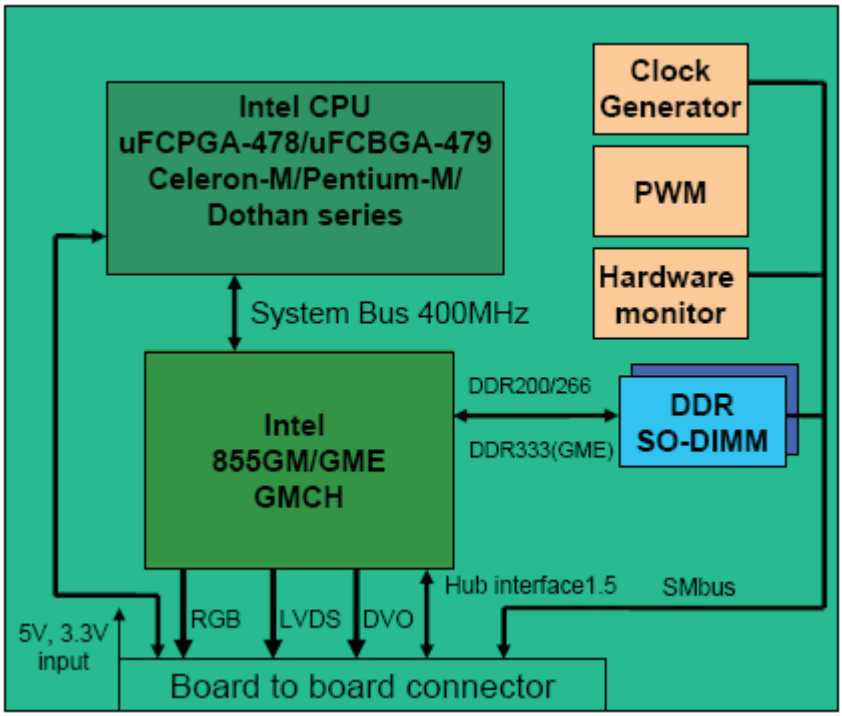


Figure 1-2: EM-64 Functional Diagram

1.3 ProCB-825 Features

The ProCB-825 is the carrier board for the NuPRO-825 and supports various I/O functions and display interfaces. The following table lists the features of ProCB-825.

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IDE	▶Supports Ultra 100 DMA mode transfer ▶One 40 Pin connector (Primary) and one CF slot (Secondary)
LAN	▶Two Gigabit Ethernets with 82540EM that co-layout with 10/100 Ethernet controller 82562EZ. ▶Wake on LAN support on LAN1 ▶WFM 2.0 compliance
S-ATA	▶Data transfer rate up to 150MB/s ▶Two port S-ATA channel support
PCI Interface	▶5V, 32-bit interface at up to 33MHz with PCI golden fingers and compliance to PCI SPEC. Rev. 2.3 ▶ PCI expansion slots
Display	▶One analog display interface that supports resolution up to 1600X1200 at 85Hz refresh and up to 2048X1536 at 75Hz refresh. ▶One channel LFP Transmitter interface to support LCD panel resolutions up to 1024X768 ▶One DVO port connect to DVI transmitter “CH-7301” that supports DVI panel resolutions up to 1024X768.
BIOS	▶Supports 4/8 Mbit Firmware Hub 82802AB(4Mb) or SST49LF004A. ▶Boot block, PNP, DMI, Write Protection and field upgradeable
Peripheral Support	▶One IEEE-1284 parallel port ▶One combo PS/2 for Keyboard and Mouse via pin header. ▶One Floppy drive Port supports both legacy 34-pin header and compact FDD connector ▶Four USB 2.0 ports, two on faceplate, two via pin header ▶One 16550A compatible serial port, RS-232 support only ▶IrDA port on header – latching connector
Miscellaneous	▶ Voltage/Chassis Intrusion, fan (2) and temperature (1) monitoring (W83627HF) ▶ APMI 1.2 ▶ Does not support Suspend to RAM or DISK ▶ Resettable fuse for power of KBD, Mouse, and USB ▶ Fan 1 w/ monitoring only (for CPU)
Form Factor	▶ Half-Size Single Board Computer, 191 x 122mm (7.5””x4.8”)

Table 1-1: ProCB-825 Feature Summary

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ICH5 I/O Controller Hub

The ProCB-825 is equipped with the highly integrated, multi-functional ICH5 I/O Controller Hub that provides the following functions and capabilities:

- PCI Local Bus Specification, Revision 2.3 with support for 33 MHz PCI operations.
- PCI slots (supports up to six Req/Gnt pairs)
- ACPI power management logic support
- Enhanced DMA controller, interrupt controller, and timer functions
- Integrated IDE controller supports Ultra ATA100/66/33
- Integrated S-ATA controller
- USB host interface with support for eight USB ports; four UHCI host controllers; one EHCI High-speed USB 2.0 Host Controller
- Integrated LAN controller
- Integrated ASF controller
- System Management Bus (SMBus) Specification, Version 2.0 with additional support for I2C Devices
- Low Pin Count (LPC) interface
- Firmware Hub (FWH) interface support

Hub Architecture

The chipset's hub interface architecture ensures that the I/O subsystem, both PCI and the integrated I/O features (S-ATA, IDE, USB, etc.), receive the bandwidth necessary for peak performance.

PCI Interface

The PCI interface of the ProCB-825 is a 32-bit, 33MHz bus and is compliant with PCI revision 2.3. All PCI signals are 5V tolerant, except PME#. There are two onboard Ethernet controllers on the PCI bus (NuPRO-825DV only). The PCI signals are also routed to the PCI golden fingers to expansion PCI slots on the PCI backplane.

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IDE Interface

The fast IDE interface supports up to four IDE devices providing an interface for IDE hard disks and ATAPI devices. Each IDE device can have independent timings. The IDE interface supports PIO IDE transfers up to 16MB/s and Ultra ATA transfers up 100MB/s. The ICH5's IDE system contains two independent IDE signal channels. They can be electrically isolated independently and can be configured to the standard primary and secondary channels (four devices). There is one 40-pin connector on the ProCB-825. The Secondary IDE channel is available through the onboard CF slot.

S-ATA Controller

The ICH5's S-ATA controller supports two S-ATA devices providing an interface for S-ATA hard disks and ATAPI devices. The S-ATA interface supports PIO IDE transfers up to 16Mb/s and Serial ATA transfers up to 150MB/s. There are two S-ATA connectors on the ProCB-825 that can operate in Combined, Enhanced, or S-ATA only mode with parallel IDE.

Low Pin Count Interface

The ICH5 implements an LPC Interface as described in the Low Pin Count Interface Specification, Revision 1.1. The Low Pin Count Interface communicates with LPC FWH and the W83627 Super I/O on the ProCB-825.

Universal Serial Bus

ProCB-825 supports four USB high-speed ports, two on faceplate and two via a 10-pin connector. All four ports are high-speed, full-speed, and low-speed capable. High-speed USB 2.0 allows data transfers of up to 480Mb/s which is 40 times faster than full-speed USB.

Ultra ATA100/66/33 IDE

The ProCB-825 supports dual Ultra ATA33/66/100 IDE channels. The ICH5 IDE controller supports both legacy mode and native mode IDE interface. In native mode, the IDE controller is a fully PCI compliant software interface and does not use any legacy I/O or interrupt resources. Note that for Ultra ATA100/66 modes operations, proper cables must be installed as well.

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LPC/Firmware Hub

System BIOS flash, SST 49LF004A, in 4Mb capacity, is compatible with Intel® 82802 Firmware Hub (FWH) device. BIOS write-protect function can be enabled/disabled in the BIOS option menu.

System Management Bus

The ICH5 provides a System Management Bus (SMBus) Specification, Version 2.0 compliant Host Controller as well as an SMBus Slave Interface. The Host Controller provides a mechanism for the processor to initiate communications with SMBus peripherals (slaves) as well as I2C compatible devices. The Slave Interface allows an external master to read from or write to the ICH5.

Real Time Clock

The ICH5 contains a Motorola MC146818A-compatible real-time clock with 256 bytes of battery backed RAM. The real-time clock performs two key functions: keeping track of time of day and storing system data, even when the system is powered down. The RTC operates on a 32.768 KHz crystal and a separate 3V lithium battery. The RTC also supports two lockable memory ranges. By setting bits in the configuration space, two 8-byte ranges can be locked to read and write accesses. This prevents unauthorized reading of passwords or other system security information.

The Real Time Clock module provides a battery backed-up date and time keeping device with two banks of 128-byte static RAM each. The design is functionally compatible with the Motorola MS146818. The time keeping comes from a 32.768KHz oscillating source, which is divided to achieve an update every second.

PCI Resource Allocation (NuPRO-825DV only)

ICH5 supports both Intel 82540EM Ethernet controllers via the PCI bus. The table below lists the PCI resource allocation of the ProCB-825.

Device/ Interface	Host	IDSEL	INT#	REQ#/GNT#
82540EM (LAN1)	ICH5 PCI	AD20	INTE#	REQ0#/GNT0#
82540EM (LAN2)	ICH5 PCI	AD21	INTF#	REQ1#/GNT1#

Table 1-2: ProCB-825 PCI Resource Allocation

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GPIO Table

The ProCB-825 provides one GPIO controller.

ICH5		Description
GPI[6]	P66DECT	Primary IDE mode detect
GPI[7]	S66DECT	Secondary IDE mode detect
GPO[19]	LAN1_DISJ	LAN1 disable
GPO[20]	LAN2_DISJ	LAN2 disable
GPO[21]	FWH_WPJ	BIOS write protect
GPO[22]	TBLOCKJ	Top Block Lock
GPIO[13]	LPC PME	PME of LPC
GPIO[34]	DIS_7301	Disable CH7301

Table 1-3: ProCB-825 GPIO table on ICH5

Ethernet Controller

The ProCB-825 comes in two configurations that correspond to the NuPRO-825**DV** and NuPRO-825**LV**. The NuPRO-825DV is equipped with two Intel® 82540EM Gigabit Ethernet controllers that are connected to the PCI 32-bit/33MHz bus. The NuPRO-825LV is equipped with one Intel® 82562EZ 10/100 Mbps Ethernet controller. The 82562EZ is connected to the ICH5 south-bridge via an LCI interface and includes a 32-bit PCI controller.

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Winbond W83627HF Super I/O

The ProCB-825 is equipped with a Winbond W83627HF Super I/O that has the following functions and capabilities:

UART

The serial port supports all functions of a standard 16550 UART including hardware flow and control interface. The UART performs serial-to-parallel conversion on data characters received from a peripheral device or a modem and parallel-to-serial conversion on data characters received from the processor.

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 of 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.

Hardware Monitor

The W83627HF monitors some critical hardware parameters, including system and CPU voltages and temperature of systems. The hardware health status can be accessed from the BIOS option menu and run-time utilities.

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1.4 NuPRO-825 Mechanical Drawing

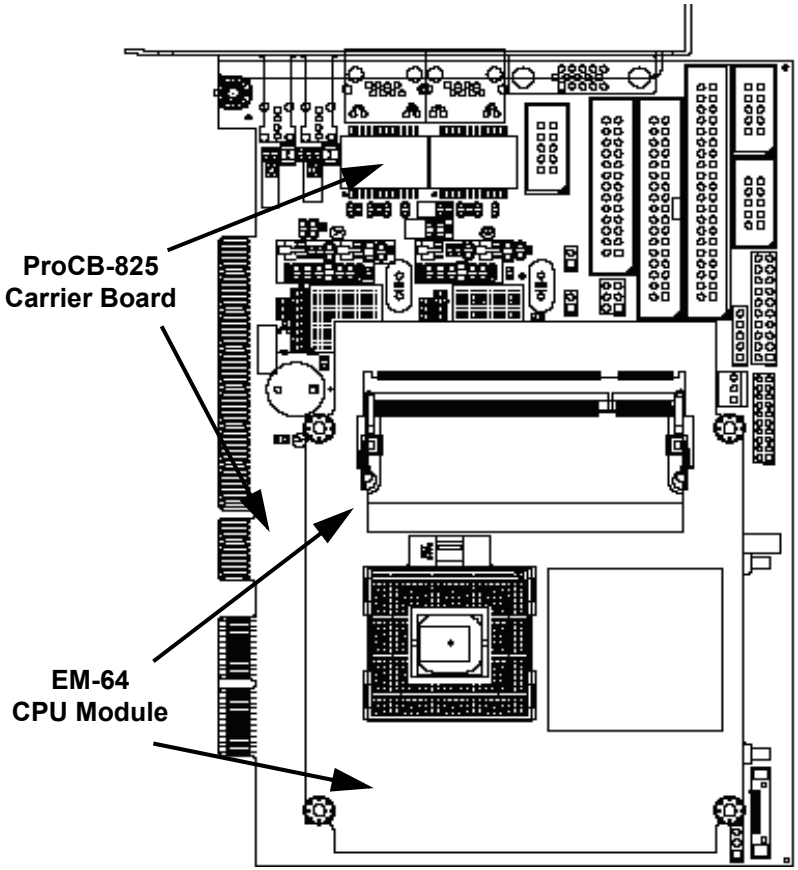


Figure 1-3: NuPRO-825 Mechanical Drawing

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1.5 ProCB-825 Components and Connectors

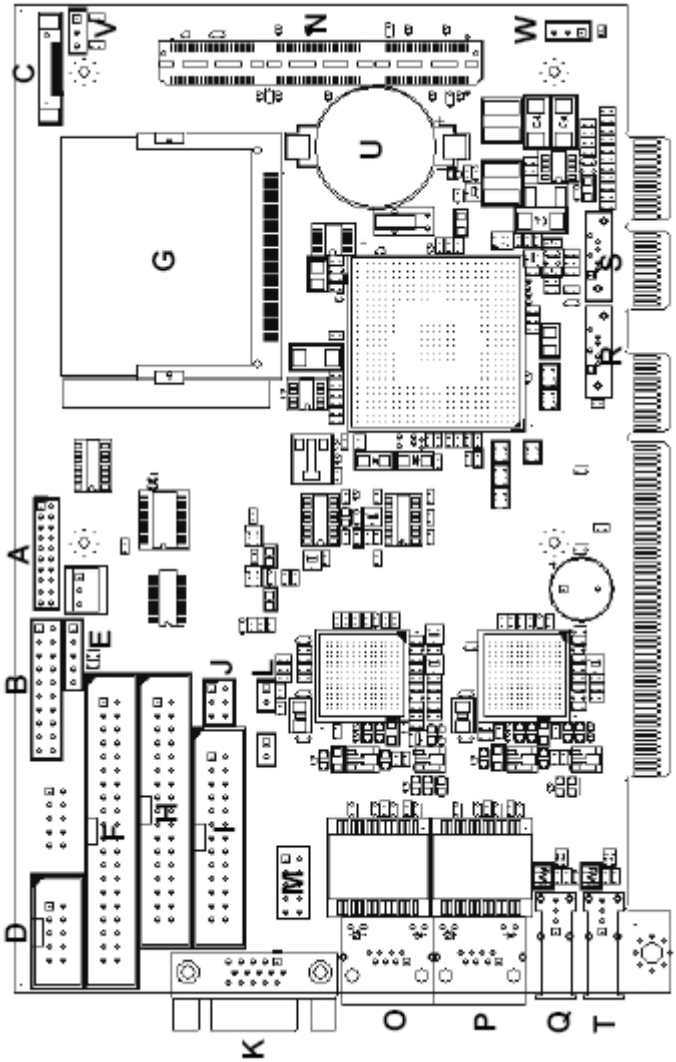


Figure 1-4: ProCB-825 Carrier Board Layout
(see Table 1-4 below)

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Carrier Board Layout Legend

A	DVI Pin Header (CN1)
B	ATX I/F connector (CN2)
C	LVDS Connector (CN3)
D	RS-232 Connector (CN4)
E	IRDA Pin Header (CN6)
F	IDE Connector (CN7)
G	CF SKT (CN8)
H	Floppy Connector (CN9)
I	Print Port Connector (CN10)
J	KB,MS Combo Pin Header (CN11)
K	VGA Connector (CN12)
L	External Temperature Sensor (CN13)
M	External USB Connector (CN14)
N	Board to Board Connector (CN15)
O	Ethernet Connector LAN1 (CN16)
P	Ethernet Connector LAN2 (CN17)
Q	USB Connector (CN18)
R	S-ATA Connector (CN19)
S	S-ATA Connector (CN20)
T	USB Connector (CN21)
U	Battery (BT1)
V	CF Select (JP3)
W	CMOS Select (JP2)

Table 1-4: ProCB-825 Carrier Board Layout

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1.6 Specifications

NuPRO-825 Specifications	
Carrier Board	ProCB-825
CPU	Single Intel® Pentium® M and Celeron® M Processors 1M L2 cache, 400MHz FSB, up to 2.0GHz
System Memory	ECC DDR SDRAM, So-DIMM x2 2GB maximum
Chipset	Intel® 855GME Graphic Memory Controller Hub
LAN	Intel® 82540EM Gigabit Ethernet Controller x2 (NuPRO-825DV) Intel® 82562EZ Ethernet controller (NuPRO-825LV)
Display Interface	VGA, DVI, and LVDS (Single channel)
Back panel I/O	10/100/1000Mbps LAN x 2 (DV) 10/100 LAN x 1 (LV) USB 2.0 x 2 VGA x 1
BIOS	Award/Phoenix
USB	Two USB 2.0 ports on faceplate Two USB 2.0 ports via onboard pin header
I/O Connectors	S-ATA x2
	IEEE-1284 Printer Port x1
	RS-232 Serial Ports x 1
	IrDA connector (5 pin)
	6-pin PS/2 keyboard/mouse interface pin header
	34 pin floppy interface pin header, supports 2 floppy devices.
Watchdog Timer	Built into w83627HF, programmable I/O port on addresses 02Eh and 02FH. Programmable timer from 1-255 seconds or 1-255 minutes. Easy-programming libraries for DOS, Windows 2000/XP are included.
Dimension	191mm x 122mm
Operating Temp.	-5 to 55ºC
Humidity	5% to 95% non-condensed
Operating System	Windows 2000, Windows XP, Linux Fedora Core 3 (other OS support upon request)
Safety Certificates and Tests	CE, FCC Class A

Table 1-5: NuPRO-825 Specifications

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1.7 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 materials for inspection by the dealer. Obtain authorization before returning any product to ADLINK.

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

Included Items
ADLINK All-in-One CD-ROM
NuPRO-825 carrier board with EM-64 CPU module
COM/LPT port bracket
2-port USB bracket
ATA-100 and FDD cable
S-ATA cables (x2)
S-ATA power cable
DVI cable
This User's Manual

Note: The packaging of the NuPRO-825 OEM version with non-standard configuration, functionality, or package may vary according to different configuration requests.

CAUTION: The NuPRO-825 single board computer 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 grounded wrist strap when servicing

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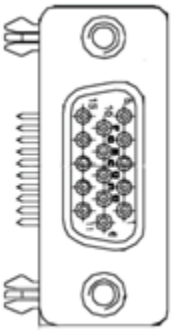
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2 Connectors and Jumpers

This chapter will familiarize the user with the connectors and jumpers on the NuPRO-825. Please refer to **Figure 1-4: ProCB-825 Carrier Board Layout** for connector and jumper locations.

2.1 Connector Pin Assignments

VGA Connector (CN12)

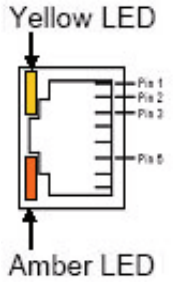


Pin	Signal	Function
1	RED	Analog RED
2	GREEN	Analog GREEN
3	BLUE	Analog BLUE
4	+5V	5V Power
5	GND	Ground
6	GND	Ground
7	GND	Ground
8	GND	Ground
9	+5V	5V Power
10	GND	Ground
11	+5V	5V Power
12	DDCDAT	DDC Data for CRT
13	HSYNC	Horizontal sync for Monitor
14	VSYNC	Vertical sync for Monitor
15	DDCCLK	DDC CLK for CRT

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Ethernet Connectors

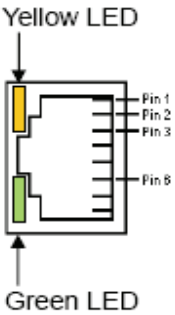
NuPRO-825DV Dual Gigabit Ethernet (LAN1: CN16, LAN2: CN17)



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 -

LED Color	Status	Function
Amber (Speed status)	ON	1000Mbps
	OFF	100Mbps
Yellow (Link status)	ON	Link
	OFF	Link off
	Blinking	Data transfer in progress

NuPRO-825LV 100/10Mbps Ethernet (LAN1: CN16)

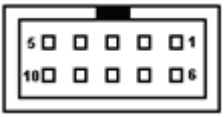


Pin	Signal	Function
1	LAN1_TDP1	Transmit Data1 +
2	LAN1_TDN1	Transmit Data1 -
3	LAN1_RDP2	Receive Data2 +
4	NC	NC
5	NC	NC
6	LAN1_RDN2	Receive Data2 -
7	NC	NC
8	NC	NC

LED Color	Status	Function
Green (Speed status)	ON	100Mbps
	OFF	10Mbps
Yellow (Link status)	ON	Link
	OFF	Link off
	Blinking	Data transfer in progress

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COM Ports (CN4)



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

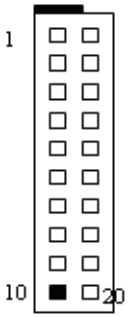
Primary IDE Connector (CN7)



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	No connect
DRQ0	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK0	29	30	Ground
IRQ14	31	32	No connect
Address 1	33	34	P66DECT
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground

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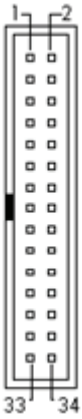
Front Panel Pin Header (CN2)



Pin	Signal	Function	Pin Group
1	+5V	Power	Power LED
2	NC	NC	
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	Key	Key Pin	
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	

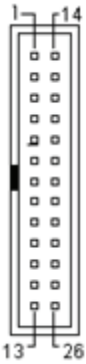
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Floppy Connector (CN9)



Signal Name	Pin	Pin	Signal Name
Ground	1	2	Drive density selection
Ground	3	4	No Connect
No Connect	5	6	Drive density selection
Ground	7	8	Index
Ground	9	10	Motor enable 0
Ground	11	12	Drive select 1
Ground	13	14	Drive select 0
Ground	15	16	Motor enable 1
Ground	17	18	Direction
Ground	19	20	Step
Ground	21	22	Write data
Ground	23	24	Write gate
Ground	25	26	Track 00
Ground	27	28	Write protect
Ground	29	30	Read data
Ground	31	32	Side 1 select
Ground	33	34	Diskette change

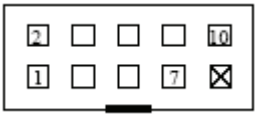
Parallel Port Connector (CN10)



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

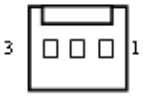
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USB Pin Header (CN14)



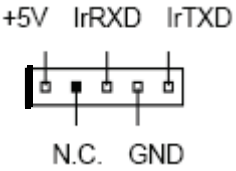
Pin	Signal Name	Pin	Signal Name
1	VCC	2	VCC
3	USBP2N	4	USBP3N
5	USBP2P	6	USBP3P
7	GND	8	GND
9	X	10	NC

FAN Connectors (FN1)



Pin	Signal Name
1	GND
2	Fan Power
3	Fan Speed

IrDA Connector (CN6)



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

External Temperature Sensor Connector (CN13)

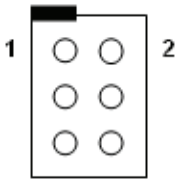


Pin	Signal	Function
1	TSEN_G	Thermal resistor Ground
2	TSEN_I	Thermal resistor input

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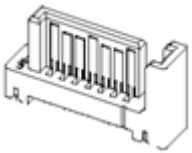
External PS/2 KB/MS Connector (CN11)

(proprietary cable provided for OEM only)



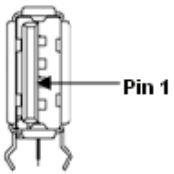
Pin	Signal Name
1	Keyboard data
2	Keyboard clock
3	Mouse data
4	Mouse clock
5	+5V
6	GND

S-ATA 1, 2 Connector (CN19/CN20)



Pin	Signal Name
1	GND
2	S-ATA_TXP
3	S-ATA_TXN
4	GND
5	S-ATA_RXN
6	S-ATA_RXP
7	GND

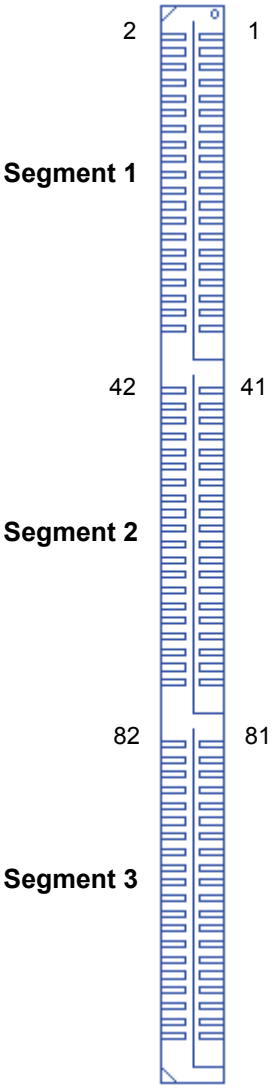
USB Connector (CN18/CN21)



Pin	Signal	Function
1	VCC	Power
2	USB -	Data (-)
3	USB +	Data (+)
4	GND	Ground

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Board-to-Board Interface Pin Definition (CN15)



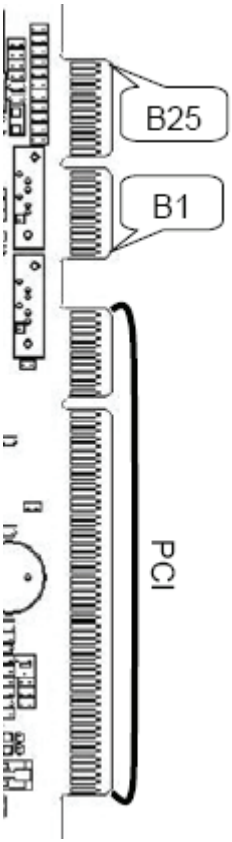
Segment 1 (Metal Plane: GND)			
Signal	**Pin**	**Pin**	**Signal**
GND	1	2	GND
DVOD0	3	4	HI_HL10
DVOD1	5	6	HI_HL9
DVOD2	7	8	GND
VCCP	9	10	HI_HL8
DVOD3	11	12	HI_HL7
DVOD4	13	14	GND
DVOD5	15	16	HI_HL6
GND	17	18	HI_HL5
DVOD6	19	20	GND
DVOD7	21	22	HI_HL4
DVOD8	23	24	HI_HL3
+3.3V	25	26	GND
DVOD9	27	28	HI_HL2
DVOD10	29	30	HI_HL1
DVOD11	31	32	HI_HL0
GND	33	34	GND
DVOCLK	35	36	HI_STB
DVOCLK#	37	38	HI_STB#
DVOCINT	39	40	Vcore
Segment 2 (Metal Plane: 3.3V)			
Signal	**Pin**	**Pin**	**Signal**
3.3V	41	42	3.3V
DVOHSYNC	43	44	CLK66
DVOVSYNC	45	46	GND
DVOBLK#	47	48	GVSYNC
GND	49	50	GHSYNC
ICLKAP	51	52	GRED
ICLKAM	53	54	GGREEN
3.3V	55	56	GBLUE
IYAP3	57	58	GND
IYAM3	59	60	HCK100
GND	61	62	GND
IYAP2	63	64	HCK100#
IYAM2	65	66	3.3V
GND	67	68	CLK48

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IYAP1	69	70	GND
IYAM1	71	72	CLK33
GND	73	74	GND
IYAP0	75	76	CLK14
IYAM0	77	78	GND
ADDCDATA	79	80	CLK33_2
Segment 3 (Metal Plane: GND)			
Signal	**Pin**	**Pin**	**Signal**
ADDCCLK	81	82	PCIRSTJ
5V	83	84	HIGNNE#
HSMI#	85	86	HNMI
HFERR#	87	88	PWROK_MCH
CPUSLP#	89	90	CPUPWGD
5V	91	92	5V
DPRSLPVR	93	94	SMD_SYS
DPSLP#	95	96	SMC_SYS
TMDS_I2CC	97	98	5V
TMDS_I2CD	99	100	MI2CDATA
5V	101	102	MI2CCLK
THERTRIP#	103	104	5V
VRPWRGD	105	106	HINIT#
HA20M#	107	108	THERMALART#
5V	109	110	HSTPCLK#
HDBR#	111	112	5V
HINTR	113	114	SUSCLK
5V	115	116	+12V
SLP_S3#	117	118	SLP_S4#
Reserve1	119	120	Reserve2

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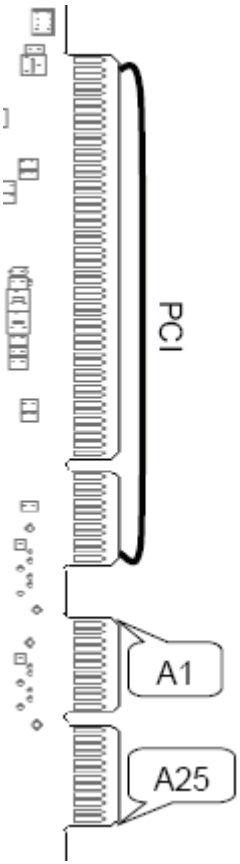
Golden Fingers - Top Side



Pin	Signal	Function
B1	REQ#	No Connection
B2	GND	Ground
B3	GNT#	No Connection
B4	CLK	No Connection
B5	PME#	PCI Slot Wake Up
B6	+12V	12V Power
B7	AC_SDIN0	No Connection
B8	GND	Ground
B9	AC_SDIN1	No Connection
B10	+5V	5V Power
B11	+5V	5V Power
B14	GND	Ground
B15	AC_BITCLK	No Connection
B16	+3.3V	No Connection
B17	+3.3V	No Connection
B18	AC_SDOUT	No Connection
B19	AC_RSTJ	No Connection
B20	CIJ	Case Open Detection
B21	FANSPD	FAN Speed Detection
B22	GND	Ground
B23	PWRBTN	Power Button
B24	PLED	Power Led
B25	SPEAKER	Buzzer Control

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Golden Fingers - Bottom Side



Pin	Signal	Function
A1	NC1	NO Connection
A2	NC2	NO Connection
A3	NC3	NO Connection
A4	SM_DAT	SM Bus Data
A5	SM_CLK	SM Bus Clock
A6	GND	Ground
A7	5VSB	5V Standby Power
A8	KB_CLK	Keyboard Clock
A9	GND	Ground
A10	KB_DAT	Keyboard Data
A11	+5V	5V Power
A14	GND	Ground
A15	PSON	Power On
A16	PWRGD	Power Good
A17	+3.3V	No Connection
A18	KBLOCK	Keyboard inhibit control input
A19	AC_SYNC	No Connection
A20	GND	Ground
A21	FANPWM	No Connection
A22	RSTBTN	Reset Button
A23	HDDLED	Hard Disk LED
A24	GND	Ground
A25	LANLED	LAN LED

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2.2 Jumper Settings

Clear CMOS Jumper (JP2)

The ProCB-825 has a clear CMOS jumper to allow the user to clear CMOS values to default values if necessary. To clear the CMOS values, apply a mini jumper to short the pins 2 and 3.



Jumper	Status
1-2	Normal (default)
2-3	Clear CMOS

CompactFLASH Select Jumper (JP3)

The ProCB-825 has a jumper to allow the user to set the CompactFLASH device as either Master or Slave on the Secondary IDE channel. Set the status of the CF device by applying a mini jumper to short the pins as shown below.



Jumper	Status
1-2	Slave (default)
2-3	Master

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3 Getting Started

This chapter gives a summary of what is required to set up a functioning system using the NuPRO-825. Hardware installation, BIOS setup and operating system installation are described. Note that the NuPRO-825 is shipped with CPU and RAM pre-installed. Installation of the CPU and RAM are performed at the ADLINK factory and the procedures outlined in the following sections are for user reference. If the default configuration does not suit your application needs, contact a local ADLINK dealer for special configurations or OEM versions.

3.1 CPU Installation

NuPRO-825 supports the Intel® Pentium® M processor. The CPU socket is located in the middle of the EM-64 CPU Module.

First remove the heatsink from the EM-64 CPU Module by removing the four screws as shown in **Figure 3.1: Heat Sink Installation**. Replace the screws to secure the EM-64 CPU Module to the carrier board.

The CPU socket is located on the EM-64 CPU Module as shown in **Figure 3.2: CPU Installation** below. Remove the CPU from its packaging and place it carefully in the CPU socket as shown. Be sure to align the gold triangle on the corner of the chip with the corner of the socket that is missing a pin. Press down gently on the chip to ensure that it is securely in place, and then use a small flathead screwdriver to rotate the CPU lock clockwise and lock the CPU into position.

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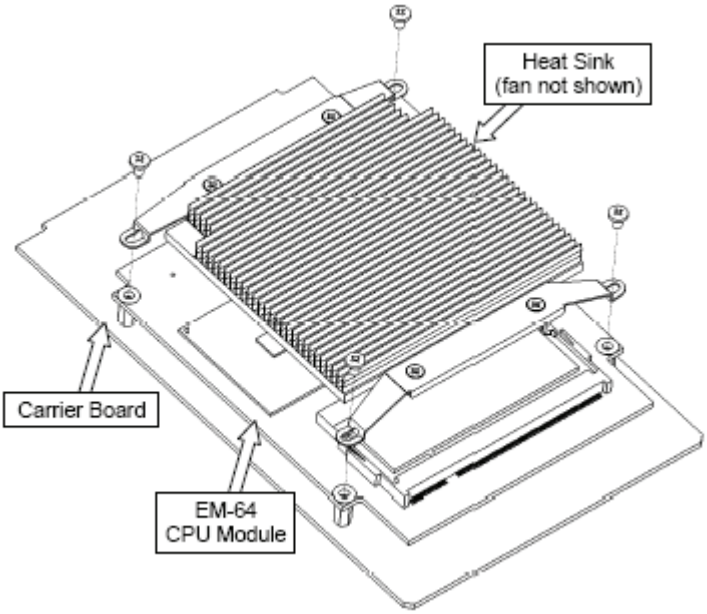


Figure 3-1: Heat Sink Installation

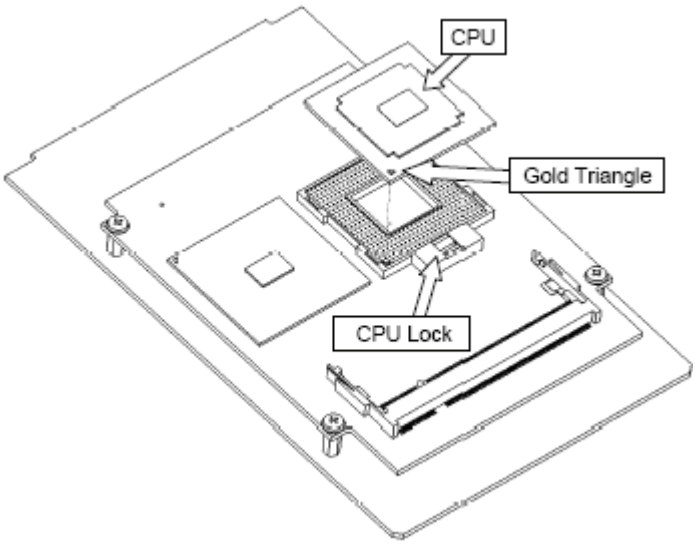


Figure 3-2: CPU Installation

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3.2 Memory Installation

The NuPRO-825 CPU Module supports 200-pin PC2100/PC2700 registered/unregistered ECC DDR SDRAM memory up to a maximum of 2GB. Two memory sockets are located on the CPU Module (one on each side). If the required memory modules are pre-installed when the package is received, this section may be skipped.

At least one memory module will be installed in DIMM Slot 1 when the NuPRO-825 is shipped. You can upgrade the amount of RAM by changing the existing memory module, or by adding a second SDRAM module. It is necessary to disassemble the NuPRO-825 to install an SDRAM module in either the DIMM1 or DIMM2 socket, so we recommend that users have the required SDRAM installed professionally by ADLINK.

The following list of memory modules has been tested for compatibility with the NuPRO-825. The table outlines the combinations of memory modules that have been tested on the NuPRO-825.

M1: Transcend 256 MB DDR266 SODIMM
M2: ATP AT64L64U8BFB3S 512MB PC2700 SODIMM
M3: UNIGEN 512 MB DDR333 SODIMM (UG064D6688LR-DH)
M4: UNIGEN 256 MB DDR333 SODIMM (UG032D7488KP-DH)

DIMM Slot1	DIMM Slot2	Total Size
M1	M2	768MB
M1	M3	768MB
M1	M4	512MB
M2	M3	1024MB
M2	M4	768MB
M3	M4	768MB

Table 3-1: NuPRO-825 Memory Compatibility

Installing the First Memory Module

Remove the heatsink as described in **Section 3.1 CPU Installation** above. Insert the module into the upper DIMM slot at a 30 degree angle and push the module firmly but gently downwards

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into the slot until the security latches on the sockets have locked into place on each side of the module (refer to **Figure 3.3: First Memory Module Installation**). There is an alignment key on the memory module to assist users with installation.

Note: Ensure that the CPU socket is in the locked position, otherwise the memory module will not seat properly.

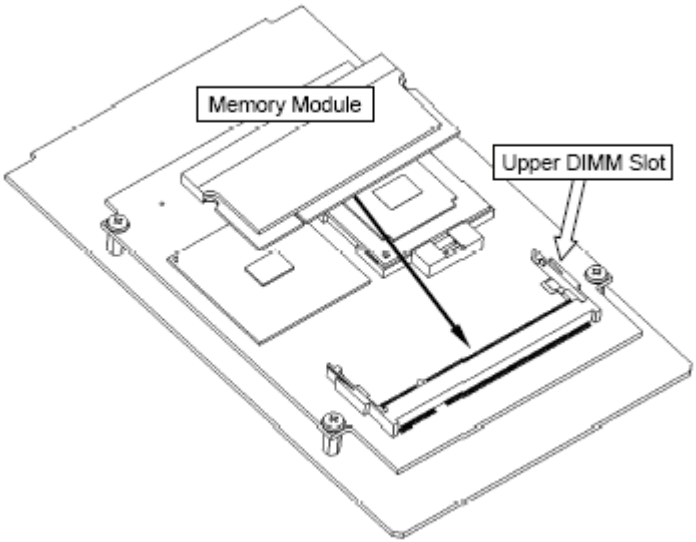


Figure 3-3: First Memory Module Installation

Installing the second memory module

Carefully remove the EM-64 CPU Module from the Carrier Board by removing the mounting screws and lifting it at the end nearest the board-to-board connector as shown in **Figure 3.4: EM-64 CPU Module Removal**. Insert the second memory module into the lower DIMM slot on the underside of the Main Board as shown in **Figure 3.5: Second Memory Module Installation** below using the same procedure as described above. Re-attach the CPU Module to the carrier board by aligning the two halves of the board-to-board connector and pressing down firmly on the CPU Module at the end nearest the connector.

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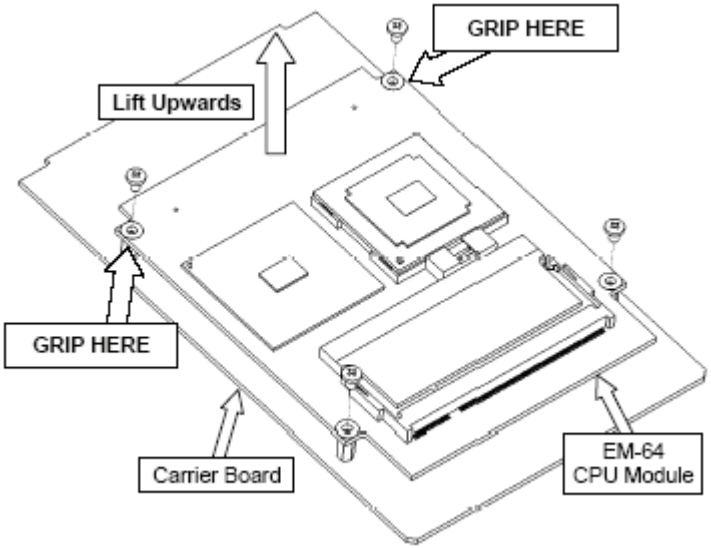


Figure 3-4: EM-64 CPU Module Removal

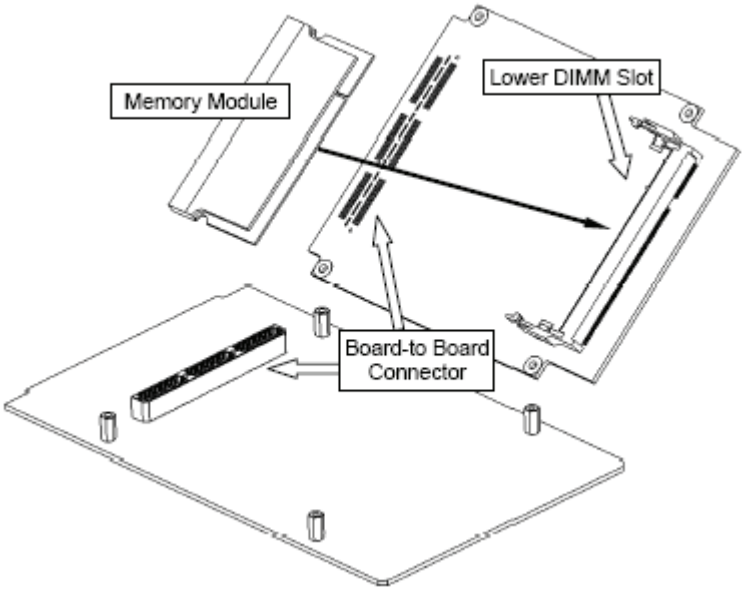


Figure 3-5: Second Memory Module Installation

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3.3 Heat Sink Installation

After you have finished installing the CPU and/or memory modules, replace the heat sink by replacing the four mounting screws. Be sure that the raised blocks on the underside of the heat sink are aligned with the CPU and northbridge on the EM-64 CPU Module (refer to **Figure 3-6: Heat Sink Installation** below).

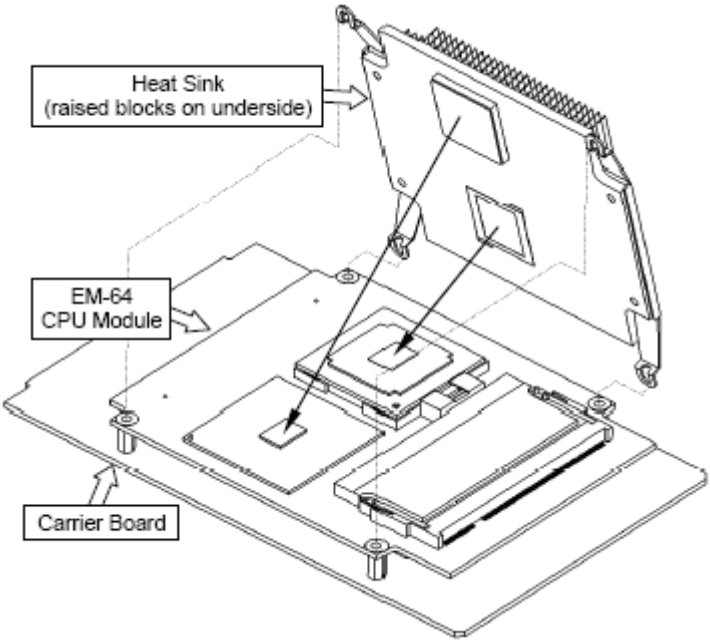


Figure 3-6: Heat Sink Installation

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3.4 Connecting IDE Devices to the NuPRO-825

The NuPRO-825 supports two IDE channels, Primary and Secondary. The Primary channel has an IDE device connector onboard supporting IDE devices running in any data transfer mode up to ATA-100 and supports two drives, a Master and a Slave. The drives connect to the NuPRO-825 with an IDE ribbon cable. The Secondary channel is dedicated to the onboard CompactFLASH socket and has an onboard jumper for Master/ Slave selection (see Section 2.2 Jumper Settings).

To install an IDE drive on the Primary channel, power down the system, connect the drive to one of the drive connectors of a suitable ribbon cable. Plug the board end of the cable into one of the IDE connectors on the NuPRO-825. Make sure pin 1 of the ribbon cable connector is aligned with pin 1 of the IDE device connector.

3.5 BIOS Configuration Overview

This section gives an introduction to the Phoenix/Award Plug and Play BIOS Setup Utility.

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 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 a menu. The parameters of 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.

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3.6 Operating System Installation

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

Installing peripheral devices: NuPRO 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 BIOS Setup Utility 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. Be sure to select appropriate device types if prompted. Refer to the appropriate hardware manuals for specific device types and compatibility modes of ADLINK NuIPC products.

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

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4 Device Driver Installation

To install drivers for the NuPRO-825, refer to the procedures described in this chapter. The drivers are located in the following directories of the ADLINK All-in-One CD:

Chipset driver	X:\NuPRO\NuPRO-825\chipset\
VGA driver	X:\NuPRO\NuPRO-825\VGA\
LAN driver	X:\NuPRO\NuPRO-825\LAN\

4.1 Intel® 855GME/ICH5 Chipset

This section describes the installation procedure for the Intel® 855GME/ICH5 chipset device driver under Windows 2000/XP.

System Requirements

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

- Windows 2000
- Windows XP

Intel® Chipset Software Installation Utility

This section describes how to install the *Intel® Chipset Software Installation Utility* on a system running Windows 2000/XP.

1. Check the System Requirements. Windows 2000/XP must be fully installed and running on the system prior to running this software.
2. Close any running applications.
3. Place the ADLINK CD into the CD-ROM drive. Run **infinst_enu6011002.exe** under **X:\NuPRO\NuPRO-825\chipset**, where X is the CD drive letter.
4. 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.

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5. Click **Next** on the *Readme Information* screen to install the INF files.
6. Click **Finish** to restart the system when prompted to do so.
7. Follow the screen instructions and use the default settings to complete setup when Windows 2000/XP restarts. Upon restart, Windows may display that it has found new hardware and is installing drivers for them. Select **Yes**, if prompted to restart Windows 2000/XP. This completes the installation of the *Intel® Chipset Software Installation Utility*.

4.2 VGA Driver Installation

Windows 2000/XP will attempt to install a standard VGA driver automatically. To guarantee compatibility, manually install the most up-to-date VGA driver, which is provided on the ADLINK All-in-One CD. After installing Windows 2000/XP, install the most up-to-date driver by following these steps:

1. Boot Windows 2000/XP, then run the program **X:\NuPRO\NuPRO-825\VGA\win2k_xp142.exe**, where X is the CD drive letter.
2. The VGA driver will automatically be installed onto the system.
3. Restart the system.

4.3 LAN Driver Installation

This section describes the LAN driver installation process for the **Intel® 82540EM Gigabit Ethernet Controller** and **Intel® 82562EZ Fast Ethernet Controller** under Windows 2000/XP. The Intel® software utilities package include a Diagnostics Utility, Makedisk Utility, and the 10/100/1000Mbps Ethernet device drivers. All drivers and utilities are stored in the ADLINK All-in-One CD under the directory: **X:\NuPRO\NuPRO-825\LAN,** where X is the CD drive letter.

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During Windows 2000/XP installation, the operating system will install a LAN driver automatically. To guarantee compatibility, manually install the most up-to-date driver, which is provided on the ADLINK All-in-One CD. After installing the OS, update the driver by following these steps:

1. Run the self-extracting file **pro2kxpm.exe** in the following directory:**X:\NuPRO\NuPRO-825\LAN**.
2. Click through the subsequent pages to extract the files to the default location **c:\Intel9.1**
3. Click **Install Software** to install the Intel® PRO Network Connections drivers.

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1. Before using ADLINK's products please read the user manual and follow the instructions exactly. When sending in damaged products for repair, please attach an RMA application form which can be downloaded from: http://rma.adlinktech.com/policy/.
2. All ADLINK products come with a limited two-year warranty, one year for products bought in China:
   - The warranty period starts on the day the product is shipped from ADLINK's factory.
   - Peripherals and third-party products not manufactured by ADLINK will be covered by the original manufacturers' warranty.
   - For products containing storage devices (hard drives, flash cards, etc.), please back up your data before sending them for repair. ADLINK is not responsible for any loss of data.
   - Please ensure the use of properly licensed software with our systems. ADLINK does not condone the use of pirated software and will not service systems using such software. ADLINK will not be held legally responsible for products shipped with unlicensed software installed by the user.
   - For general repairs, please do not include peripheral accessories. If peripherals need to be included, be certain to specify which items you sent on the RMA Request & Confirmation Form. ADLINK is not responsible for items not listed on the RMA Request & Confirmation Form.

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   - Damage caused by carelessness on the user's part during product transportation.
   - Damage caused by fire, earthquakes, floods, lightening, pollution, other acts of God, and/or incorrect usage of voltage transformers.
   - Damage caused by unsuitable storage environments (i.e. high temperatures, high humidity, or volatile chemicals).
   - Damage caused by leakage of battery fluid during or after change of batteries by customer/user.
   - Damage from improper repair by unauthorized ADLINK technicians.
   - Products with altered and/or damaged serial numbers are not entitled to our service.
   - This warranty is not transferable or extendible.
   - Other categories not protected under our warranty.
4. Customers are responsible for shipping costs to transport damaged products to our company or sales office.
5. To ensure the speed and quality of product repair, please download an RMA application form from our company website: http://rma.adlinktech.com/policy. Damaged products with attached RMA forms receive priority.

If you have any further questions, please email our FAE staff: service@adlinktech.com.

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