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NEMONIX™ Engineering

NX-DEGX2-TA

***Dual Port Gigabit Ethernet
Controller for HP AlphaServers***

Installation Procedure and User Manual

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© NEMONIX™ Engineering Inc.
56 Hudson St.
Northborough, MA 01532
Phone 800.435.8650 • Fax 508.393.8846

Thank you for purchasing this high performance NEMONIX™ Engineering Dual Port Gigabit Ethernet controller for HP AlphaServer systems. This upgrade is a superior cost effective approach to the complex issue of system expansion and acquiring Gigabit Ethernet speed for AlphaServer systems.

NEMONIX™ Engineering Dual Port Gigabit Ethernet controller is currently available for the AlphaServer DS, ES, and GS series of systems.

The NEMONIX™ Engineering alternative, allows you to maximize the Return of Investment of your existing computer system to gain a significant competitive advantage for your firm.

All NEMONIX™ Engineering upgrades are warranted for 3 years.

Please keep this manual close to your system for easy reference.

Table of Contents

Installing the NX-DEGX2-TA NEMONIX™ Engineering Dual Port Gigabit Ethernet Controller Hardware	1
Safety Precautions	1
System Requirements	1
Controller Installation Process	2
Connecting the Network Cables.....	2
Installing the NX-DEGX2-TA NEMONIX™ Engineering Dual Port Gigabit Ethernet Controller Software Drivers	3
Gigabit Ethernet Card Optional Speed Setup:	4
Technical Specifications.....	5
FAQ.....	6
Troubleshooting.....	9
How to contact NEMONIX™ Engineering Technical Support	9
How to contact NEMONIX™ Engineering after Business Hours.....	9
NEMONIX™ Engineering Installation and Warranty Support Contact Information	10

Installing the NX-DEGX2-TA NEMONIX™ Engineering Dual Port Gigabit Ethernet Controller Hardware

The following installation instructions are intended to assist persons with a basic knowledge of the HP OpenVMS operating system and associated AlphaServer hardware. If you are unfamiliar with the internal operation and workings of the AlphaServer systems, we can assist you with installation over the phone, or provide you with the name of a recommended computer maintenance company to perform the installation. If any difficulty is encountered with this installation, please contact NEMONIX™ Engineering Technical Support at 1-800-435-8650.

NOTE:

Before you begin, make sure the system(s) is running error free. Turn the power switch to the (ON) position. Allow the system to run through the power-up diagnostic and then boot the operating system. It is important to log any errors during the power-up procedure. If you have encountered any errors, please ensure that these problems have been resolved prior to installing your new adaptor.

Warning:

Disconnecting power to your system without following the OpenVMS shutdown procedure may result in loss of data.

Safety Precautions



WARNING - The controller is being installed in a system that operates with voltages that can be lethal. Before you remove the cover of your system, you must observe the following precautions to protect yourself and to prevent damage to the system components.

- Remove any metallic objects or jewelry from your hands and wrists.
- Make sure to use only insulated or non-conducting tools.
- **Verify that the system is powered OFF and unplugged before accessing internal components.**
- Installation or removal of adapters must be performed in a static-free environment. The use of a properly grounded wrist strap or other personal antistatic devices and an antistatic mat is strongly recommended.

System Requirements

Before installing the Gigabit Ethernet Controller, make sure your system meets the following requirements.

- HP OpenVMS Version 7.3-2 Alpha and above
- AlphaServer based DS, ES or GS series computer
- One open PCI 64 slot 33/66/100 MHZ or One Open PCI-X 64-bit 66/100 MHz Bus Interface Slot
- This controller will not work in a standard PCI slot in your AlphaServer

Controller Installation Process

- The following instructions apply to installing the Gigabit Ethernet Controller in most AlphaServer systems. Refer to the manuals that were supplied with your system for specific details about performing these tasks on your particular system.
- Before installing the controller, ensure the system power is OFF and unplugged from the power outlet, and that proper electrical grounding procedures have been followed.
- Remove the system cover and select any empty 64 bit PCI or PCI-X slot. If you do not know how to identify a 64 bit PCI or PCI-X slot, refer to your system documentation.
- Remove the blank cover-plate from the slot that you selected.
- Holding the card by the edges, align the controller's connector edge with the connector dock in the system.
- Applying even pressure at both corners of the card, push the controller card until it is firmly seated in the slot. When properly seated, the controller's port connectors will be aligned with the slot opening, and its faceplate will be flush against the system chassis.



Caution—Do not use excessive force when seating the card, as this may damage the system or the controller. If the card resists seating, remove it from the system, realign it, and try again.

- Secure the adapter with the adapter clip or screw.
- Replace the system cover and disconnect any personal antistatic devices.
- Power the system on.
- Once the system returns to proper operation, the adapter hardware is fully installed.
- You must next connect the network cables

Connecting the Network Cables

The NX-DEGX2-TA adapter has two RJ-45 connectors used for attaching the system to Ethernet copper-wire segments. When automatic link negotiation is disabled, the port can be configured for 10 Mbps, 100 Mbps, and signaling in either half-duplex or full-duplex operation. Speeds of 1000 Mbps are only obtainable through Auto-Negotiation.

Perform the following procedure for connecting a network cable to the Gigabit Ethernet Controller:

- Prepare an appropriate cable. Table 1 lists the cable characteristics for connecting to 10/100/1000BASE-T ports.
- Connect one end of the cable to the controller.
- Connect the other end of the cable to the appropriate Ethernet network port.

Table 1 10/100/1000BASE-T Cable Specifications

Port Type	Connector	Media	Maximum Distance
10BASE-T	RJ-45	Cat. 3, 4, or 5 UTP	100 meters (328 feet)
100/1000BASE-T	RJ-45	Cat. 5 UTP	100 meters (328 feet)

NOTE: – 1000BASE-T signaling requires four twisted pairs of Category 5 balanced cabling, as specified in ISO/IEC 11801:1995 and EIA/TIA-568-A (1995) and tested using procedures defined in TIA/EIA TSB95.

NOTE: – Once the cable is properly connected at both ends, the adapter port LEDs should be functional.

Hardware installation of the NX-DEGX2-TA NEMONIX™ Engineering Dual Port Gigabit Ethernet controller is now complete.

Installing the NX-DEGX2-TA NEMONIX™ Engineering Dual Port Gigabit Ethernet Controller Software Drivers

Installing the software driver for the Nemonix Dual Port Gigabit Ethernet card

- A. For systems running OVMS V8.2, the software driver is already installed. There are no other steps required.
- B. For systems running OVMS V7.3-2, the following instructions are required:
 1. Load the CD labeled “Nemonix Dual Port Gigabit Ethernet Card Driver” into an accessible CD ROM drive
 2. Mount the CD under VMS
`$MOUNT ddcu: DEGX2-TA`
 3. On the CD in the directory ddcu:[V732] find the file SYS\$EW5700.EXE
 4. Copy the file SYS\$EW5700.EXE from this directory to the system disk directory SYS\$COMMON:[SYS\$LDR]
`$COPY ddcu:[V732] SYS$EW5700.EXE SYS$COMMON:[SYS$LDR]`
 5. If installing on a VMS cluster with a common system disk, copying the driver once is sufficient. Otherwise, perform these steps on each system where a Nemonix dual port gigabit Ethernet card is being installed.
 6. On the next boot of the system the software driver will be loaded by VMS and you are now ready to setup the Ethernet ports for use by your communications software (DECnet, TCP/IP For Open VMS,

etc – See your communications software manuals for information regarding setting up the software ports for use)

Gigabit Ethernet Card Optional Speed Setup:

The DEGX2-TA Dual Port Gigabit Ethernet Card comes pre-configured from Nemonix Engineering to auto-negotiate speed and mode (half or full duplex). This means that the speed and mode of the card will auto-configure to 10Mb, 100Mb, or 1Gb half or full duplex based on the speed and mode of the card on the destination system. You can however configure the card to a fixed speed of 10Mb, 100Mb, or 1Gb and half or full duplex. This is accomplished using the Alpha system console to set the speed and mode.

The Alpha console identifies the ports on the Dual Gigabit Ethernet card as EGA0 (upper port on the board) and EGB0 (lower port on the board)

If you wish to manually set the speed and mode of one or both ports use the following instructions:

The following command will list out all current device settings:

```
P00>>>SHOW EG*           ! List settings for both EGA0 and EGB0
P00>>>SHOW EGA*         ! List settings for EGA0
P00>>>SHOW EGB*         ! List settings for EGB0
P00>>>SHOW *            ! List all system settings
```

You can manually set the speed and mode of the Dual Gigabit Ethernet Card ports as follows:

```
P00>>> SET EGA0_MODE AUTO           ! (Default Setting – 1Gb)
P00>>> SET EGB0_MODE AUTO           ! (Default Setting – 1Gb)

P00>>> SET EGA0_MODE 10mbps         ! (10Mb Half Duplex)
P00>>> SET EGB0_MODE 10mbps         ! (10Mb Half Duplex)

P00>>> SET EGA0_MODE 10mbps_full_duplex ! (10Mb Full Duplex)
P00>>> SET EGB0_MODE 10mbps_full_duplex ! (10Mb Full Duplex)

P00>>> SET EGA0_MODE 100mbps        ! (100Mb Half Duplex)
P00>>> SET EGB0_MODE 100mbps        ! (100Mb Half Duplex)

P00>>> SET EGA0_MODE 100mbps_full_duplex ! (100Mb Full Duplex)
P00>>> SET EGA0_MODE 100mbps_full_duplex ! (100Mb Full Duplex)
```

** Important Note **

You will find the following two modes available through the console. These modes are not supported and will not work with the Nemonix DEGX2-TA Dual Port Gigabit Ethernet card. For 1 Gigabit operation you must use "AUTO" mode.

```
P00>>> SET EGAX_MODE 1000mbps       ! (1000Mb Half Duplex)
P00>>> SET EGAX_MODE 1000mbps_full_duplex ! (1000Mb Full Duplex)
```

Technical Specifications

Interface Standard:	AlphaServer 64 bit PCI 33/66/100Mhz PCI-X 32/64-bit, 66/133MHz
Bus Architecture:	PCI-X bus-mastering, compatible with existing PCI bus
Dimensions:	PCI Short card; 2.5" (63.5 mm) H x 6.6" (167.6 mm) L
Weight:	2.47 oz (70 grams)
PCI Card Type:	Universal 64 bit Card
PCI Voltage:	+5V (Min 4.75V, Max, 5.25V)
PCI Connector:	Universal / 64 bit
Holder:	Metal Bracket
Power Consumption:	1.6A at 5V: Typical all ports operate at 1000Mbit/s. 0.7A at 5V: Typical all ports operate at 100Mbit/s. 0.65A at 5V: Typical all ports operate at 10Mbit/s.
Operating Humidity:	0%–90%, non-condensing
Operating Temperature:	0°C – 50°C (32°F - 122°F)
Storage:	-20°C–65°C (-4°F–149°F)
Certifications:	FCC Part 15, Subpart B class B, CE EN 55022 CE EN 55024 CE EN 60950

Ethernet Specifications

IEEE Standard / Network topology:	Gigabit Ethernet, 1000Base-T Fast Ethernet, 100Base-TX Ethernet, 10Base-T
Simplex / Full duplex operation	Supports Simplex & Full duplex operation in both operating speeds
Auto negotiation	Auto-negotiation between full duplex and simplex operations and between 10Mb/s 100Mb/s speeds and duplex 1000Mb/s.
Data Transfer Rate:	100 and 10 Mbits/sec in simplex mode per port 2000Mbit/s 200 and 20 Mbit/s in full duplex mode per port
Cabling:	10Base-T: Category 3, 4 or 5 UTP; 100Base-TX: Category 5 UTP; 1000Base-T: Category 5 UTP (or better)

LED/Connector Specifications

LEDs	(3) LEDs per port Link Activity: blinks 100Mbps/s 1000Mbit/s
LED location	LEDs are located on the PCB and are visible via holes in the metal bracket holder.
Connectors	(2) Shielded RJ-45



FAQ

1. Why Gigabit Ethernet?

Today's demanding data transfers require higher and higher speeds to ease network congestion. In addition, most environments need to minimize CPU utilization for network overhead. The Nemonix Engineering line of Ethernet adaptors for HP OpenVMS does just that. Joining that lineup is a new AlphaServer adaptor Dual Port Gigabit Ethernet controller with a full 64 bit data path and PCI-X bus support. The pipeline gets widened to support higher throughput with less CPU utilization.

2. What AlphaServer platforms does this Gigabit Ethernet controller run on?

It has been tested to run on the AlphaServer DS, ES, and GS series. It should run on any AlphaServer that utilizes a 64 bit AlphaServer PCI or PCI-X bus including the ES47, ES80 and GS1280. We are also testing it on earlier models such as the 800, 1000, 1200, and 1400. While currently incompatible in those early 64 bit PCI bus configurations, we are making a modification to allow it to operate in these earlier systems as well.

3. Is this a true 64 Bit PCI-X option?

Yes! This card is a 64 bit PCI-X card but is fully backward compatible with 64 bit PCI33/66/100 slots on your AlphaServer.

4. What operating systems does this option support?

It ships configured to run on AlphaServers with HP OpenVMS Version 7.3-2 and above. Prior versions of HP OpenVMS may work, but are not supported by NEMONIX™ Engineering. In the near future we will have this hardware option and drivers available for Linux and Windows on Intel platforms also.

5. Will this card support failover on the Ethernet under HP OpenVMS?

Yes, the card has been tested to support failover should one of the connections fail. This gives you redundancy on the network without the cost of extra hardware in your systems.

6. Will you support HP TRU64 on AlphaServer?

At this time we have no plans to ship this card with HP TRU64 support. However, if a customer should have this requirement we will discuss it with them.

7. Do you have a Fiber variant of this card?

No, at this time we only have a copper variant. However, we can supply you with copper to fiber converters if you need this capability to integrate into an existing fiber network or for connections over long distances.

8. Do I need to do anything special to support Gigabit Ethernet in my 10/100 environment?

No, the NEMONIX™ Engineering Gigabit Ethernet card is fully compatible with your existing CAT 5 UTP backbone. No need to replace your existing infrastructure while you upgrade to Gigabit Ethernet for all your network needs. Of course you will need a Gigabit Ethernet switch to take advantage of the speeds that Gigabit Ethernet provides. Our new option is shipped with Auto Negotiation turned on and is set for Gigabit full duplex. Manual configuration of the board is supported if you do not have a network that supports Auto Negotiation.

9. Why should I buy this option?

Several reasons: 1. for slot limited AlphaServers, such as the DS10L and DS20L, this option gives you the availability of an extra Gigabit Ethernet port with the same footprint as a single port version. 2. Even in systems with 3 or more PCI slots, it opens up a PCI slot for another PCI option of your choice. 3. It gives AlphaServers the speed that comes with having Gigabit Ethernet rather than 100Mb Ethernet only. 4. If you are migrating to Integrity servers using OpenVMS, this option gives you configurability choices using multiple Gigabit Ethernet with your new servers.

10. What kind of performance can I expect to see?

The answer to this depends on the several things. It includes how you have configured your network, the other devices in your network, how your OS and applications are configured and what kind of system you have installed it in.

11. Will this controller work with AlphaServers running UCX™, DECnet™, TCP/IP, and Multinet™?

Yes, we have successfully tested the device to run in all four environments.

12. Will this card co-exist with my built in AlphaServer 10/100 Mb Ethernet controller?

Yes, both options will coexist with each other so that you can take advantage of all 3 Ethernet ports.

13. Do I need to do anything special to make this controller work in my AlphaServer?

No, we include driver and device support for this card when it ships. A one time command procedure at Installation time configures the card for its lifetime in the network you install it on. Successive reboots require no additional manual intervention.

14. Why should I use the Dual port card rather than 2 single rail cards?

3 reasons: 1. Cost, two single Gigabit Ethernet controller cards would cost you up to 30% more than a single dual Gigabit Ethernet card from Nemonix. 2. Dual connectivity on a single card allows you to use your limited real estate better. 3. Performance is equal to having 2 single Gigabit cards installed.

15. How is this card different from any other dual Gigabit Ethernet card?

The card represents a full year effort including both Hardware and Software (drivers), between HP, BroadCom and NEMONIX™ Engineering to bring this card to market. That included hardware revisions to meet AlphaServer unique demands and OpenVMS driver engineering. Originally

planned by HP and BroadCom, the effort was taken over by NEMONIX™ Engineering in the fall of 2004 at the request of HP. We continue to work with Broadcom and OpenVMS Engineering to ensure you the quality you have come to expect from your VAX and AlphaServer investments.

16. Who supports the DEGX2-TA controller?

This is a Nemonix Engineering product. As such NEMONIX™ Engineering supports the controller.

The controller comes with a full 3 year warrantee. NEMONIX™ Engineering provides you with phone support for installation and troubleshooting should that be necessary for the life of the warrantee. If you prefer to have onsite installation, NEMONIX™ Engineering will arrange for a third party to install your card at an additional cost. In the unlikely event that you have a bad controller during the warrantee period, a new card will be shipped the same day.

Many of our options are maintained by HP and other third party service providers. If you desire to have your option on maintenance contract with your local service provider, please contact them and we will work with them on your behalf. Sparing options are available.

17. Are there plans for future AlphaServer hardware options from NEMONIX™ Engineering?

Yes, as we have done with VAX for the past 20 years, we are planning a full range of PCI and PCI-X controllers to bring additional hardware features to AlphaServer system.

Troubleshooting

NEMONIX™ Engineering products carry a 3 year warranty. Many clients elect to add NEMONIX™ Engineering products to their existing on-site hardware service. Regardless of whether you have added the NEMONIX™ Engineering product(s) to your existing contract or not, you (or your maintenance company) must contact NEMONIX™ Engineering if you suspect a problem.

Note:

If any errors have occurred during the Power-Up Procedure, the card may be incorrectly installed and/or seated. It is necessary to review the installation procedure to insure proper installation. Once reinstalled, reboot the OpenVMS Operating System. Repeat the Power-Up Diagnostics. If an error still occurs, contact NEMONIX™ Engineering Technical Support.

How to contact NEMONIX™ Engineering Technical Support

Should you suspect a problem with your NEMONIX™ Engineering option, our Technical Support Department is available to assist you in your troubleshooting efforts. Technical Support Personnel are available Monday through Friday, excluding holidays, between the hours of 9am and 5pm EST.

Technical Support in North America can be reached by calling 1-800-435-8650.

For our customers in Europe, please call 01-508-393-7700.

The receptionist will then connect you to a Technical Support Representative.

How to contact NEMONIX™ Engineering after Business Hours

NEMONIX™ Engineering Technical Representatives can be reached after our normal business hours. However, warranty support is only available during normal work hours of 9am and 5pm EST, Monday through Friday. Local holidays are excluded.

Please call us toll free at 1-800-435-8650. You will reach the NEMONIX™ Engineering Voice Messaging System. **It is important that you listen to the instructions carefully so that we know how to contact you.**

NOTE:

The NEMONIX™ Engineering Customer Service Mail Box is a paging system. It is important you leave a voice message. This will ensure that a NEMONIX™ Engineering engineer will receive a page to respond to your call.

1. The Messaging System will state: If this is an emergency, please press 5. **PRESS the number 5.**
2. The Messaging System will state: You have reached the Customer Service Mail Box.
3. The Messaging System states: Please press 2 to leave a message. **PRESS the number 2.**
4. Please leave your name, your company name and a phone number where you can be reached within a half hour. Leave a brief message detailing the problem that is occurring with your system. **PRESS THE POUND (#) KEY.**
5. The Messaging System states: To confirm and save your message, press 2. **PRESS the number 2.**
6. Your message has been logged. The Voice Messaging System has activated a page to the NEMONIX™ Engineering Engineer on call. You will receive a call from NEMONIX™ Engineering within the hour.

NEMONIX™ Engineering Installation and Warranty Support Contact Information

Warranty Replacement:

In the unlikely event of a failure, under the terms and conditions of the warranty, please follow the steps below.

Step One: Obtain a RETURN AUTHORIZATION (RA) NUMBER from NEMONIX™ Engineering.

Step Two: After receiving your Return Authorization Number, package the item appropriately and ship to:

Nemonix Engineering
56 Hudson St.
Northborough, MA 01532
ATTN: RA#

Note: Make sure you adequately insure the item being shipped

By obtaining an authorization to return a defective unit, you automatically initiate a Warranty Replacement shipment to your facility.

If you need further assistance, please contact us at:

800-435-8650

508-393-7700

Fax: 508-393-8846

E-mail: engnemonix@nemonixengineering.com

Internet : www.nemonixengineering.com