



# PCI-Express Quad Port Gigabit LAN Card Instruction Manual (Model: CN7741-Y)

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 Hitachi Data Systems

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# Preface

This manual describes how to install and handle the Hitachi PCI-Express Quad Port Gigabit LAN Card (hereinafter referred to as the LAN Card).

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**Notice:** The use of the Compute Rack is governed by the terms of your agreements with Hitachi.

## Regulatory compliance notices

### Federal communications commission (FCC) compliance (U.S.A)

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

The user is cautioned that changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

### Canadian compliance statement (Canada)

This Class A digital apparatus complies with Canadian ICES-003.  
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

### European union notice (EU)

Products with the CE Marking comply with both the EMC Directive (2004/108/EC) and the Low Voltage Directive (2006/95/EC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms (the equivalent international standards are in parenthesis):

- EN55022 Class A Limit-Electromagnetic Interference
- EN55024 (EN61000-4-2, 3, 4, 5, 6, 8, 11)-Electromagnetic Immunity
- EN61000-3-2, 12-Power Line Harmonics
- EN61000-3-3-Power Line Flicker
- EN60950-1 (IEC60950-1)-Product Safety

Warning: This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

### Acoustics noise (Germany)

Maschinenlärminformations-Verordnung - 3. GPSGV, der höchste Schalldruckpegel beträgt 63 dB(A) oder weniger gemäss EN ISO 7779.

## Product recycling and disposal (EU and Norway) (Waste Electrical and Electronic Equipment Directive 2002/96/EC [WEEE])

The following mark on Products indicates that these Products are to be collected separately and to be recycled or discarded according to applicable local and national regulations. For further information regarding return, collection, recycle or disposal, please contact your sales company where you purchased the Products.



Note: The above regulation / marking applies only to countries within the European Union (EU) and Norway.

## Chinese RoHS

有毒有害物质和元素的名称及含量

零件名称	有毒有害物质和元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
伺服器底座	×	○	○	○	○	○
刀鋒型伺服器	×	○	○	○	○	○
管理模块	×	○	○	○	○	○
局域网交换机模块	×	○	○	○	○	○
光纤交换机模块	×	○	○	○	○	○
网络路径模块	×	○	○	○	○	○
电源模块	×	○	○	○	○	○
分电盘	×	○	×	○	○	○
<p>○：表示该零件的所有均质材料中的有毒有害物质的含量在 SJ/T 11363-2006 标准规定的限量范围内。</p> <p>×：表示该零件的某一均质材料中的有毒有害物质的含量超出 SJ/T 11363-2006 标准规定的限量范围。</p>						

## 電波障害自主規制 (Japan)

本製品は、クラス A 情報技術装置です。本製品を家庭環境で使用すると電波障害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

VCCI-A

## Class A emission statement (Korea)

이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

Applicant / 상호명 : LG Hitachi Ltd. / LG히다찌(주)

Manufacturer / 제조자 : HITACHI, LTD.

Origin / 제조국 : Japan / 일본

## BSMI compliance (Taiwan)



### 法規遵循公告

警告使用者：

此為甲類資訊技術設備，於居住環境中使用時，可能會造成射頻擾動，在此種情況下，使用者會被要求採取某些適當的對策。



## International compliance

No	Standard / Marking	Classification	Country
1	UL 60950-1  	Safety	U.S.A
2	FCC 47 CFR Part 15 Class A Limit  <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:              (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.</p> </div>	EMC	
3	<b>EMC Directive</b> (2004/108/EC, formerly 89/336/EEC) EN55022 Class A Limit EN55024 EN61000-3-2, EN61000-3-12 EN61000-3-3 <b>Low Voltage Directive</b> (2006/95/EC, formerly 73/23/EEC) EN60950-1  	Safety / EMC	Europe
4	CB IEC 60950-1	Safety	International

## Intended audience

This document is intended for the personnel who are involved in planning, managing, and performing the tasks to prepare your site for Compute Rack installation and to install the same.

This document assumes the following:

- The reader has a background in hardware installation of computer systems.
- The reader is familiar with the location where the Compute Rack will be installed, including knowledge of physical characteristics, power systems and specifications, and environmental specifications.

## Document revision level

Revision	Date	Description
00	March 2012	Preliminary release
01	December 2012	Secondary release

## Document organization

The table below provides an overview of the contents and organization of this document. Click the chapter title in the left column to go to that chapter. The first page of each chapter provides links to the sections in that chapter.

Chapter	Description
Chapter 1, <a href="#">Before use</a>	Describes what you should be familiar with before connecting and setting this Card.
Chapter 2, <a href="#">Product overview</a>	Describes the product overview.
Chapter 3, <a href="#">Names and function of components</a>	Describes the names and functions of components of this Card. Read this chapter before you install the Card on the system unit.
Chapter 4, <a href="#">Installing the Card</a>	Describes how to install the Card on the system unit.
Chapter 5, <a href="#">Installing a driver</a>	Describes how to install the network driver of the LAN Card in the Windows 2008 R2 environment.
Chapter 6, <a href="#">Supplementary Note on LAN Card Function</a>	Describes the notes on the LAN Card functions.
Chapter 7, <a href="#">Troubleshooting</a>	Describes how to address malfunctions of the LAN Card.
Chapter 8, <a href="#">Specifications</a>	Describes main specifications of the Card.

## Document conventions

The term “Compute Rack” refers to all the models of the Compute Rack, unless otherwise noted.

This document uses the following typographic conventions:

Convention	Description
<b>Bold</b>	Indicates text on a window, other than the window title, including menus, menu options, buttons, fields, and labels. Example: Click <b>OK</b> .
<i>Italic</i>	Indicates a variable, which is a placeholder for actual text provided by the user or system. Example: <i>copy source-file target-file</i> <b>Note:</b> Angled brackets (< >) are also used to indicate variables.
screen/code	Indicates text that is displayed on screen or entered by the user. Example: # pairdisplay -g oradb
< > angled brackets	Indicates a variable, which is a placeholder for actual text provided by the user or system. Example: # pairdisplay -g <group> <b>Note:</b> Italic font is also used to indicate variables.
[ ] square brackets	Indicates optional values. Example: [ a   b ] indicates that you can choose a, b, or nothing.
{ } braces	Indicates required or expected values. Example: { a   b } indicates that you must choose either a or b.
vertical bar	Indicates that you have a choice between two or more options or arguments. Examples: [ a   b ] indicates that you can choose a, b, or nothing. { a   b } indicates that you must choose either a or b.
<u>underline</u>	Indicates the default value. Example: [ <u>a</u>   b ]

## Safety information

Before replacement, read the Safety Guidelines in this document.

## Getting help

When you contact Hitachi Data Systems, provide as much information about the problem as possible, including:

- The circumstances surrounding the error or the failure
- The exact content of any error message displayed on the host system Compute Rack
- The service information messages, including reference codes and severity levels, displayed and/or logged at the Compute Rack

The Hitachi Data Systems support staff are available 24 hours a day, seven days a week. For technical support, visit the portal site at <https://portal.hds.com>. For contact information, visit [www.hds.com](http://www.hds.com).

## Comments

Please send us your comments on this document, if any, by e-mail to: [doc.comments@hds.com](mailto:doc.comments@hds.com).

Make sure that the e-mail includes the document title and number, revision, and section(s) and paragraph(s) whenever possible.

***Thank you!*** (All comments become the property of Hitachi.)



# Safety guidelines













This section contains warnings and important safety guidelines for using a Hitachi Compute Rack System. Read and understand the information in this section before removing, replacing and installing system components.

This section includes the following key topics:

- [Safety information](#)
- [Common precautions concerning safety](#)
- [General safety precautions](#)
- [Precautions against damage to this product](#)
- [Precautions Marks in This Manual](#)

## Safety information

This document uses the following symbols to emphasize certain information.

Symbol	Label	Description
	WARNING	This indicates the presence of a potential risk that might cause death or severe injury.
	CAUTION	This indicates the presence of a potential risk that might cause relatively mild or moderate injury.
<b>NOTICE</b>	NOTICE	This indicates the presence of a potential risk that might cause severe damage to the equipment and/or damage to surrounding properties.
	Note	This indicates notes not directly related to injury or severe damage to equipment.
	Tip	This indicates advice on how to make the best use of the equipment.
	Fire Hazard	This warns fire hazard. Take appropriate precautions to prevent the risk of catching a fire.
	Electric Shock Hazard	This warns electric shock hazard. Failure to take appropriate precautions could result in serious injury or death.
	Hot Surface	Hot Surface indicates the risk of a serious burn by high temperature.
	Laser Hazard	This warns laser hazard. Failure to take appropriate precautions could result in invisible laser radiation.
	General Prohibition Sign	This indicates the general prohibition.
	Disassembly Prohibition Sign	This indicates not to allow customer to disassemble component.
	General Mandatory Sign	This indicates a general action to take. Action by following the instructions in this guide.
	Unplug Power cord	This indicates unplugging the power cable from the outlet to avoid electric shock and fire.

## Common precautions concerning safety

Please carefully read through these safety instructions to follow:

- When operating the equipment, follow the instructions and procedures provided in the manual.
- Be sure to follow notes, cautionary statements and advice indicated on the equipment or in the manual.
- Referring to manuals attached to other products which you install in or connect to the equipment, follow the instructions described in those manuals.

Failure to follow those instructions can cause injury, fire or damage to property including the equipment.

## General safety precautions

---



### Plastic shipping bag

Do not leave the plastic shipping bag of this product such as Air Cap within reach of children. If they get the bag over their head, they can be suffocated.

---

## Precautions against damage to this product

---



### Impact due to dropping, etc

Avoid excessive impact such as dropping or banging the equipment. Deformation or deterioration may occur, which may cause smoke or malfunction.

---



### Contact with connector terminals

Never touch connector terminals with hand or with a metal. Nor insert a foreign material such as wire. Also, do not put this product on metal chips. Otherwise, smoke or contact failure may be caused.

---



### Contact with connector terminals

Never touch connector terminals with hand or with a metal. Nor insert a foreign material such as wire. Also, do not put this product on metal chips. Otherwise, smoke or contact failure may be caused.

---



### Countermeasure against static electricity

Before handling this product, discharge static electricity from your body by touching a metallic part such as a door knob, or wear cotton gloves. Otherwise, static electricity may damage the equipment.

---



### **Mounting this product**

Mount and use this product in a system unit that supports installation and operation of this product. If mounted in any other system, this product causes a failure due to difference in connection specifications. For information about which system units support this product, see the manual of the individual system unit.

---

## **Precautions Marks in This Manual**

---



Not used in this manual.

---



### **Signal cables**

■ Lay the cables carefully to prevent your foot from being snagged by them. If you stumble over the cable, it may cause personal injury or malfunction of the connection devices. Also it may cause the data to be lost.

■ Do not put something heavy on the cable. Do not lay the cable near a heater. The cable coating may be damaged which may cause a failure of the connected equipment. See page 4-2.

---

**NOTICE**

Not used in this manual.

---



## Before use

This chapter provides the information you have to know before connecting and setting the LAN Card.

- [For your confirmation](#)

## For your confirmation

Confirm the following matters before use. If you should have a problem with the product, contact the sales representative.

- Is it the model or type you ordered?
- Are there any parts damaged during shipping?
- Are all the accessories of the Accessory List included in the package?  
If a separate sheet of additional information is included, be sure to read it.

## Product overview

This chapter describes the product overview.

- [Features](#)

## Features

This card is used by being attached to the PCI-Express expansion slot (hereinafter referred to as PCI slot) of the system unit. This product has the following features.

- It supports 1000BASE-T (IEEE802.3ab) and equipped with 4 ports for network interface connectors.
- It is connected with the cable of Enhanced Category 5.



PXE/iSCSI boot:

This Card does not support a PXE/iSCSI boot.

---



Wake On LAN:

This Card does not support Wake On LAN.

---



PCI Hot-Plug function:

This Card does not support a PCI Hot-Plug function.

---



Jumbo frame:

This Card does not support a jumbo frame.

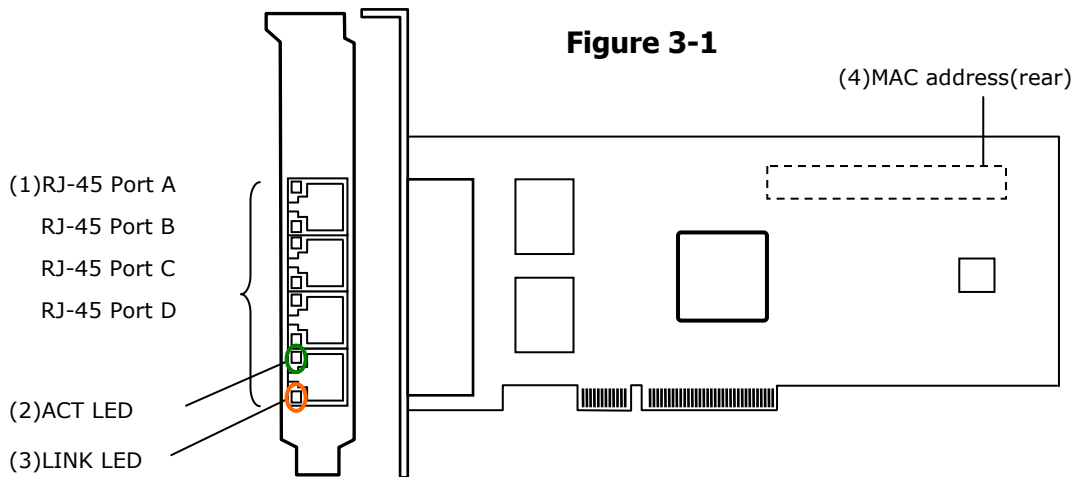
---

## Names and function of components

This chapter describes the names and functions of components of this Card. Read this chapter before you install the Card on the system unit.

- [Names and functions](#)

## Names and functions



- (1) RJ-45 connector  
Connects a LAN cable.  
At 10 Mbps: Category 3, category 4, category 5, and enhanced category 5  
At 100 Mbps: Category 5 and enhanced category 5  
At 1000 Mbps: Enhanced category 5

- (2) LINK/ACT LED

LED	Color	Status	Indication
ACT	Green	On	Established a link to HUB
		Blink	Now sending/receiving data
	-	Off	Not establish a link to HUB.

- (3) 1000M SPEED LED

LED	Color	Status	Indication
LINK/SPEED	Orange	On	Connected to HUB of 1000 Mbps
	Green	On	Connected to HUB of 100 Mbps
	-	Off	Connected to HUB of 10 Mbps

- (4) MAC address  
1st to 12th digits obtained from IEEE (one MAC address possessed)

## Installing the Card

This chapter describes how to install the Card on the system unit.

- [System configuration and installation Procedure](#)
- [How to connect the Card](#)

## System configuration and installation procedure

Install the LAN Card into the PCI slot of the system unit. For the procedures to install the system unit, see the manual supplied with the system unit.



When this Card is replaced, its specific information (example: MAC address) is changed.

## How to connect the Card

This section describes how to connect the Card.



### Signal cables

- Lay the cables carefully to prevent your foot from being snagged by them. If you stumble over the cable, it may cause personal injury or malfunction of the connection devices. Also it may cause the data to be lost.
- Do not put something heavy on the cable. Do not lay the cable near a heater. The cable coating may be damaged which may cause a failure of the connected equipment. See page 4-2.

## Connecting a LAN cable

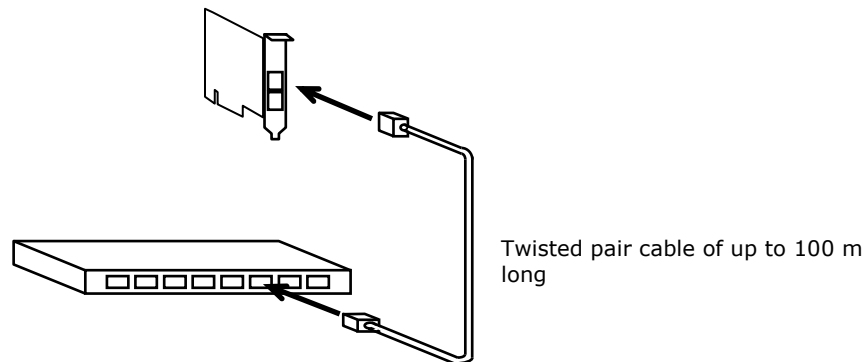
Use the LAN cables listed in the following table to connect the LAN Card. Do not use any other cable.

**Table 4-1**

10Mbps 10BASE-T	<ul style="list-style-type: none"><li>• UTP Categories 3, 4, and 5 ((up to 100 m)...(Category 5 is recommended)</li><li>• UTP Enhanced Category 5 (up to 100 m)</li></ul>
100Mbps 100BASE-TX	<ul style="list-style-type: none"><li>• UTP Category 5 (up to 100 m)</li><li>• UTP Enhanced Category 5 (up to 100 m)</li></ul>
1000Mbps 1000BASE-T	<ul style="list-style-type: none"><li>• UTP Enhanced Category 5 (up to 100 m)</li></ul>



1. Push the lock of the twisted pair cable's connector slightly and insert the cable into the connector of the LAN Card until it locks.
2. Push the connector lock at the other end of the twisted pair cable slightly and insert the cable into the connector of the hub until it locks.



**Figure 4-1**



When connecting the LAN cable to the network interface connector, pay attention to the following. If you handle the cable improperly, it may cause the network interface connector to break.

- Use the TIA/EIA-568 compliant cables of UTP (unshielded twisted pair) Category 3, Category 4, Category 5, or Enhanced Category 5.
- For the network interface connector of the LAN cable, use an RJ-45/ISO8877 compliant connector.
- Lay the LAN cable so that it may not give stress to the network interface connector.
- When removing the LAN cable, push the hooks of the cable connector slightly and pull the cable straight out.



If you connect the LAN cable between the Card or directly to a LAN device installed on another system without connecting to network equipment (such as HUB), an attempt to disconnect the LAN cable after linkup may cause the SPEED LED/LINK LED on the Card to light up or blink. In such a case, unplug the LAN cable and then plug again (connected state → unconnected state), the LED will go out.



## Installing a driver

This chapter describes how to install the network driver of the LAN Card in the Windows 2008 R2 environment. When the LAN expansion function is used, see "Instructions for Setting the LAN Expansion Function" contained in the "**Drivers Kit \*\*\*\*-10-\*\***" CD. (\* is an arbitrary number).

The supported OS varies depending on the system unit to which the driver is to be installed. Be sure to confirm the supported OS of the system unit to which it is to be installed. For details about how to install drivers of optional Cards including this LAN Card, see the software guide supplied with the system unit.

- [Windows 2008 R2 environment](#)

# Windows 2008 R2 environment



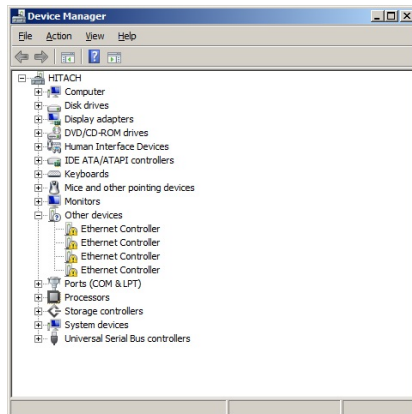
When connecting the LAN cable to the network interface connector, the drivers bundled in the Windows 2008 R2 cannot be used.

When CN7741-Y or CN7741-R LAN Card is added, be sure to apply the driver in the "Drivers Kit \*\*\*\*-10-\*\*" CD. (\* is an arbitrary number). If the driver is preinstalled as a factory expanded model, it is not necessary to install.

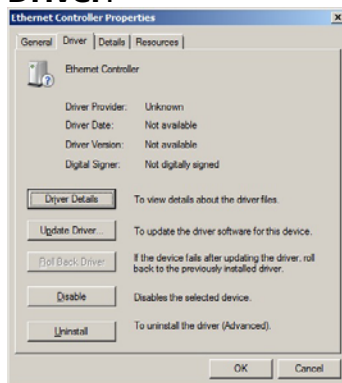
## Procedure for installing the driver for Windows 2008 R2

When using this LAN Card, install the network driver for the Windows 2008 R2. This is the installation procedure for updating the driver, provided that Windows 2008 R2 is already installed.

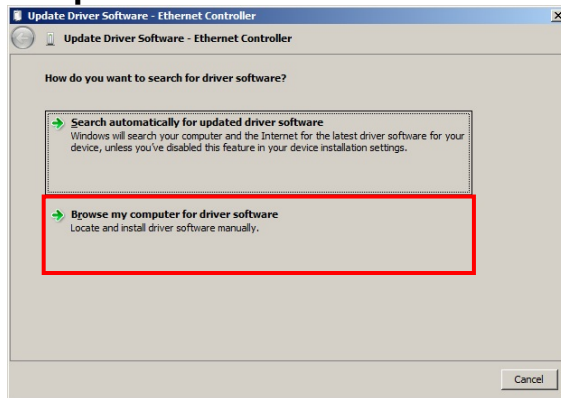
1. Log in with the **user name** having the administration authority (such as Administrator).
2. Click **Hardware** of **Control Panel** and then click **Device Manager** of **Devices and Printers**. In the Device Manager window, double-click **Ethernet Controller** under **Other devices**.



3. The Property window opens. Click the **Driver** tab and then click **Update Driver**.



- The **Update Driver Software** window opens. Click **Browse my computer for driver software**.



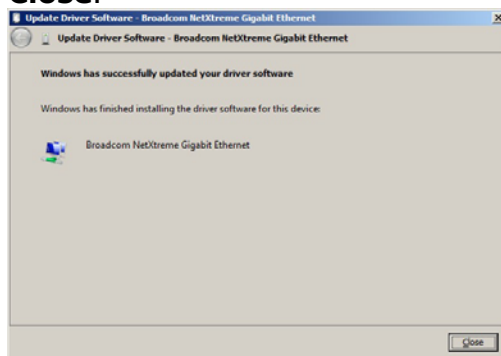
On the **Update Driver Software** window, insert the "**Drivers Kit \*\*\*\*-10-\***" CD. (\* is an arbitrary number). into the CD-ROM or DVD-RAM drive and enter the directory shown below. Then click **Next**.

**Table 5-1**

OS	LAN driver storage location
Windows 2008 R2	D:\WIN2008R2\DRIVERS\LAN\BROAD_01\x64

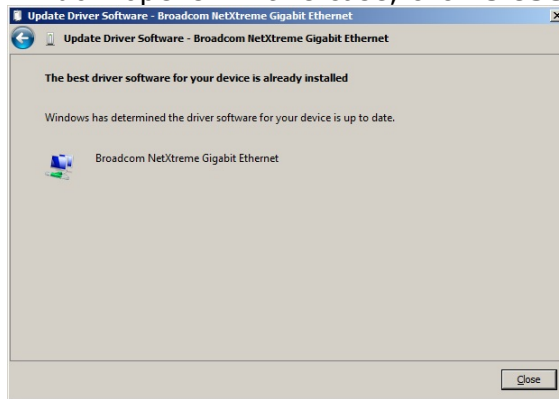


- Broadcom NetXtreme Gigabit Ethernet** is detected and the corresponding driver is installed to the system unit from the "**Drivers Kit \*\*\*\*-10-\***" CD. (\* is an arbitrary number). When **Windows has finished installing the driver software for this device** appears, click **Close**.

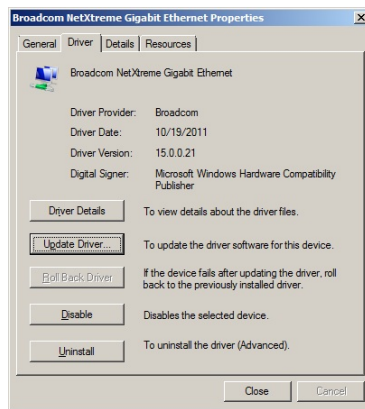




If the driver has been already updated to the latest version, following window opens. In this case, click **Close**.



6. The **Property** window opens. Click the **Driver** tab and then click **Uninstall**.



Click **OK**



7. For the device whose device driver has not been updated, repeat steps 2 to 6. Check that **Broadcom NetXtreme Gigabit Ethernet** appears by the number of installed Cards under **Network adapters**.
8. Updating LAN driver for all adapters is completed, click **Action** of **Scan for hardware change**. Then LAN driver will be updated automatically.

9. Please carry out "RxDurINT.bat" in the following directories.

**Table 5-2**

OS	LAN driver storage location
Windows 2008 R2	D:\WIN2008R2\UTILITY\RxDurINT\RxDurINT.bat

10. Check the IP address. The initial value is obtained automatically. If the fixed value is to be used, it is necessary to change the IP address setting. After setting, check to connect the LAN cable to its destination such as a hub and then restart the system unit.



When completed the driver set-up, the message **This device cannot start. (Code10)** may appear. In this case, restart the system unit and it will work properly. After rebooting, check **Device Manager** to work the driver properly.



Restrictions to change parameters of the network adapter

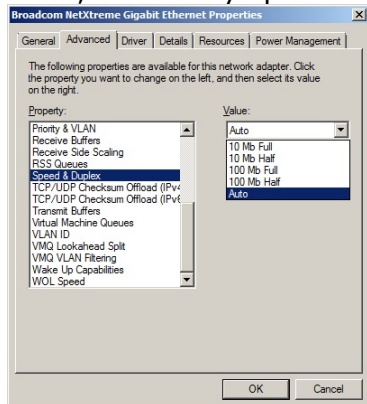
After changing the network adapter setting, transmission may not be made normally with the changed adapter. Check the changed network adapter in the Device Manager window. If "!" is displayed, right-click the adapter and disable it. Then enable the adapter again. The adapter becomes available.



The transmission rate is selected automatically (10 Mbps, 100 Mbps, and 1000 Mbps). Depending on the network environment, the transmission rate may not be obtained automatically. In this case, set the fixed transmission rate according to the procedure described below.

## Procedure for setting a fixed communication speed

1. Click **Hardware** of **Control Panel** and then click **Device Manager** of **Devices and Printers**. In the Device Manager window, double-click **Broadcom NetXtreme Gigabit Ethernet** under **Network adapters**.
2. In the Property window, click the **Advanced** tab and then click **Link Speed & Duplex**. (Default: Auto Negotiation)
3. Then, select any speed from **Value (V)**. After setting, click **OK**.



4. Restart the OS.



Do not change any item other than **Link Speed**.



Restrictions on the half-duplex transmission at 10 or 100 Mbps  
If the LAN Card is used with the transmission rate of 10M half-duplex or 100M half-duplex, change the setting of "Large Send Offload (IPv4)" or "Large Send Offload (IPv6)" to "Disabled". For details, refer to page 6-2.



Click **Control Panel, Network and Internet, Network and Sharing Center**, and **Change adapter settings** in this order. The IP address can be changed by clicking the **Properties** button of **Local Area Connection** and selecting a property of **Internet Protocol Version \* (TCP/Ipv\*)**. The location of the LAN Card can be checked by clicking the **Configure** button.



When more than one LAN Card are mounted, set different network IDs (the part masked by a subnet mask) for individual Cards. If the same network ID is set for more than one LAN Card, the system unit may lack of stability.



# Supplementary Note on LAN Card Function

This chapter describes the notes on the LAN Card functions.

- [TCP Checksum Offload function](#)
- [Setup method in each OS](#)

## TCP Checksum Offload function

Even though the LAN Card has a function to calculate the TCP/IP checksum, it is recommended to use the operating system's standard TCP/IP checksum calculation function instead of the LAN Card's function. If the TCP/IP checksum is set to be calculated by the operating system, the operating system checks integrity of the packet data received from the network at the final phase of protocol processing. This helps to configure a more reliable system.

## Setup method in each OS

### Windows 2008 R2

Click **Hardware** of **Control Panel** and then click Device Manager of **Devices and Printers**. In the Device Manager window, double-click **Broadcom NetXtreme Gigabit Ethernet** under **Network Adapter**. Click to **Detail** tab.

When a setting item is displayed on the following list, please change setting according to a list.

**Table 6-1 Settings**

Item	Configuration	
	Broadcom Advanced Control Suite 4 not installed	Broadcom Advanced Control Suite 4 installed
IPv4 Checksum Offload	Rx & Tx Enabled→None	Rx & Tx Enabled→None
TCP/UDP Checksum Offload (IPv4)	Rx & Tx Enabled→None	Rx & Tx Enabled→None
TCP/UDP Checksum Offload (IPv6)	Rx & Tx Enabled→None	Rx & Tx Enabled→None
Large Send Offload (IPv4)	Enable→Disable	Enable→Disable
Large Send Offload v2 (IPv4)	Enable→Disable	Enable→Disable
Large Send Offload v2 (IPv6)	Enable→Disable	Enable→Disable
Receive Side Scaling	Enable→Disable	Enable→Disable

When you finish setting the above items, click [OK] and restart the OS.

# Troubleshooting

This chapter describes how to address malfunctions of the LAN Card.

This chapter describes actions to be taken when the LAN Card does not operate properly. If a problem remains after the following actions are taken, contact your sales representative or call the maintenance personnel:

**Table 7-1**

No.	Problem	Verification & how to take action
1	The LAN Card is not recognized properly.	<ul style="list-style-type: none"> <li>• Check if the driver is installed correctly.</li> <li>• Check if the LAN Card is inserted in the PCI slot correctly.</li> </ul> <p>Try removing and installing it again to see if the problem is resolved.</p>
2	LINK/ACT LED does not light even though the network cable is connected.	<ul style="list-style-type: none"> <li>• Check if the LAN Card is recognized correctly.</li> <li>• Check if the driver is installed correctly.</li> <li>• Check if the power is turned at the connected device.</li> <li>• Check if the correct LAN cable is used. Use a UTP cable of Category 3 or higher class for 10BASE-T. For 100BASE-TX, use a UTP cable of Category 5 or higher class. And for 1000BASE-T, use a UTP cable of Enhanced Category 5.</li> <li>• Check if the length of the LAN cable exceeds the limit. The cable length must be 100 m at most for 10BASE-T, 100BASE-TX, and 1000BASE-T.</li> <li>• Check if the link to the connected device is established. Check that ACT/LNK LED or the LAN connector is not pulled out and the corresponding pin is not bent.</li> <li>• Check if the transmission mode is set to a combination available for the connected device. Try checking of SPEED LED and transmission rate. If the transmission rate is set to automatic, try changing it to a fixed setting.</li> </ul>
3	The OS is not bootable.	<ul style="list-style-type: none"> <li>• Check if the LAN Card operates normally. When the OS becomes unbootable after the LAN Card is installed, try removing the Card and booting the OS without the LAN Card.</li> </ul>

# Specifications

This chapter describes main specifications of the Card.

- [Hardware specifications](#)

## Hardware specifications

**Table 8-1**

No.	Item		Specification
1	Communication functions	Supported standards	IEEE802.3 10BASE-T Ethernet IEEE802.3u 100BASE-TX Fast Ethernet IEEE802.3ab 1000BASE-T Gigabit Ethernet IEEE802.3x Flow Control
		Data transfer rate	10 Mbps/100 Mbps and Full/Half Duplex 1000 Mbps Full Duplex
		No. of ports	10/100/1000 Mbps×4 ports (RJ45)
		Bus interface	Compatible with PCI-Express2.0 (No. of lanes: x2)
		Cable	10 Mbps: UTP Categories 3, 4, and 5 (up to 100 m)
			100 Mbps: UTP Category 5 (up to 100 m)
1000 Mbps: UTP Category 5e (up to 100 m)			
2	Power consumption		1.24 A at +3.3 VDC (Average 4.09 W)
3	Environmental conditions	Operating temperature	0°C to 45°C
		Operating humidity	0% to 90% (non-condensing)
4	EMI		FCC Class A

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