USER MANUAL

LH1690C-LC-R3

# NETWORK INTERFACE ADAPTER PCIE

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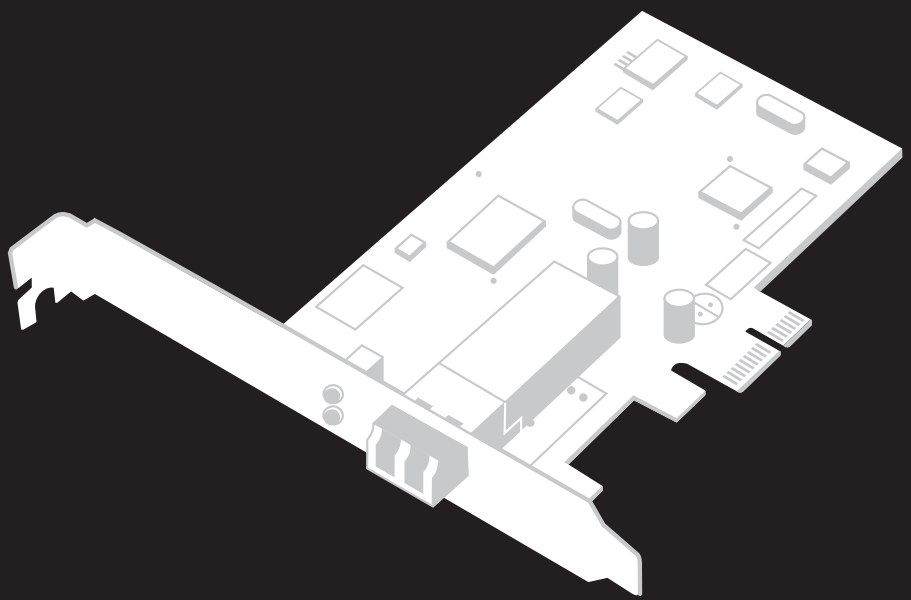

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## ESD WARNINGS

### ELECTROSTATIC DISCHARGES (ESD)

A sudden electrostatic discharge can destroy sensitive components. Proper packaging and grounding rules must therefore be observed. Always take the following precautions:

1. Transport boards and cards in electrostatically secure containers or bags.

2. Keep electrostatically sensitive components in their containers, until they arrive at an electrostatically protected workplace.

3. Only touch electrostatically sensitive components when you are properly grounded.

4. Store electrostatically sensitive components in protective packaging or on anti-static mats.

### GROUNDING METHODS

The following measures help to avoid electrostatic damages to the device:

5. Cover workstations with approved antistatic material. Always wear a wrist strap connected to a properly grounded workplace.

6. Use antistatic mats, heel straps, and/or air ionizers for more protection.

7. Always handle electrostatically sensitive components by their edge or by their casing.

8. Avoid contact with pins, leads, or circuitry.

9. Turn off power and input signals before inserting and removing connectors or connecting test equipment.

10. Keep your work area free of non-conductive materials, such as ordinary plastic assembly aids and Styrofoam.

11. Use field service tools such as cutters, screwdrivers, and vacuum cleaners that are conductive.

# CHAPTER 1: SPECIFICATIONS

## TABLE 1-1. SPECIFICATIONS

| SPECIFICATION | DESCRIPTION |
|---|---|
| Approvals | FCC Class B, CE, RoHS, EMI |
| Standards | IEEE 802.3z Gbit/s 1000BASE-X;<br>IEEE 802.3x Full-Duplex Flow Control;<br>IEEE 802.1Q VLANs |
| Connectors | (1) 850 nm LC Multimode |
| Fiber Cable Supported | 62.5-/125-µm, 50-/125 µm multimode |
| Indicators | LEDs on bracket: (1) Link/Act, (1) FDX |
| Data Transfer Mode | Full-duplex with flow control;<br>1000 Mbps speed |
| Bus Slot | PCI-e 1.1 compliant |
| Power | From the PCI-e bus; maximum 1.32 W +3.3 VDC at 0.4 A |
| Software Supported | Microsoft Windows XP, Vista, Server 2008/R2, Windows 7, Windows 8/8.1, Server 2012;<br>Novell Netware 5.x, 6.x Server;<br>Novell Netware DOS Client for ODI 16-bit;<br>NDIS2 driver Support DOS MS client, Lantastic, Lanman, Norton Ghost;<br>Linux driver for kernel up to 4.7;<br>FreeBSD 7.x and 8.0 driver |
| Dimensions | Card only: 4.5 x 2.75 in. (11.43 x 6.98 cm;)<br>With bracket: 5 x 4.75 in. (12.7 x 12.06 cm) |
| Weight | 0.119 lb. (0.054 kg) |
| Environmental | Operating Temperature: 32 to 104˚ F (0 to 40˚ C);<br>Humidity: 5 to 90% |

# CHAPTER 2: OVERVIEW

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## 2.1 INTRODUCTION

The Network Interface Adapter PCIe 1000BASE-SX LC (LH1690C-LC-R3) is a Gigabit Ethernet Board that fully complies with all IEEE 802.3z and 1000BASE-X standards. Two LED indicators (LINK/ACT and FDX) on the bracket will help to oversee the board link, activities and full-duplex status. The adapter has one 850-nm LC multimode fiber connector.

## 2.2 FEATURES

- Supports high-bandwidth 1000 Mbps network speed
- Complies with IEEE 802.3z 1000BASE-X fiber interface
- Operates in full-duplex mode
- Uses ieee 802.3x full-duplex flow control
- Has (1) PCI-e bus, complies with PCIe rev 1.1 interface
- Supports jumbo frame
- Offers high-level VLAN filtering
- Supports IP headers and TCP/UDP checksums offload
- On-board screening of VLAN tagged ethernet frames
- Supports Wake On LAN
- Complies with RoHS standard

## 2.3 WHAT'S INCLUDED

Your package contains the following item:

- (1) Network Interface Adapter PCIe 1000BASE-SX LC (LH1690C-LC-R3)

If this is missing or damaged, contact Black Box Technical Support at 877-877-2269 or info@blackbox.com

# CHAPTER 3: HARDWARE INSTALLATION

The following instructions apply to installing the Network Interface Adapter PCIe in most systems. Refer to the manuals that were supplied with your system for details about performing these tasks on your particular system.

To install the network adapter card, perform the following procedure:

WARNING: Before installing the adapter, make sure the system power is OFF and unplugged from the power outlet, and that you have followed proper electrical grounding procedures.

1. High voltage inside the system presents a safety hazard. Make sure the power is off before removing the cover.

2. Remove the system cover and select any empty PCIe slot. See Fig 3-1.

NOTE: If you do not know how to identify a PCIe slot, refer to your system documentation.

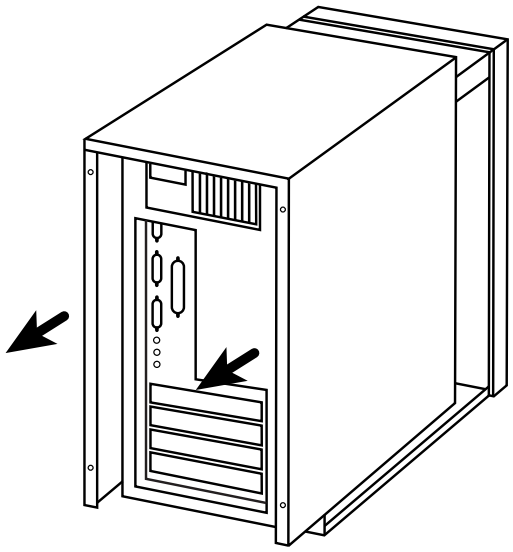

FIGURE 3-1. REMOVE THE SYSTEM'S COVER

3. Select an empty, non-shared PCIe slot and remove the faceplate. Keep the faceplate in a safe place. You may need it for future use.

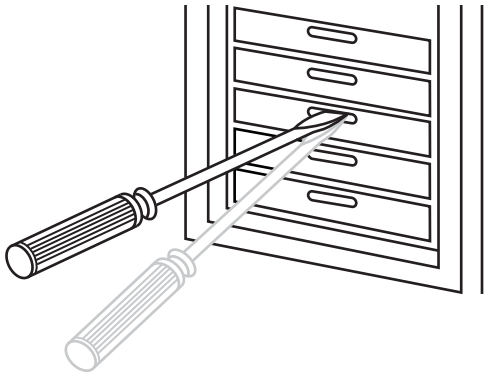

FIGURE 3-2. REMOVE THE PCIE SLOT'S FACEPLATE

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**NOTE: If you cannot locate or know how to find an PCIe slot, refer to the documentation that came with your system.**

4. Remove the Network Interface Adapter PCIe from the shipping package and store the packaging material in a safe location.

CAUTION: Wear a grounding device and observe electrostatic discharge precautions when installing the network adapter card in a system. Failure to observe this caution could result in damage to the card.

5. Applying even pressure at both corners of the card, push the adapter card until it is firmly seated in the PCIe slot. Make sure the card is securely seated.

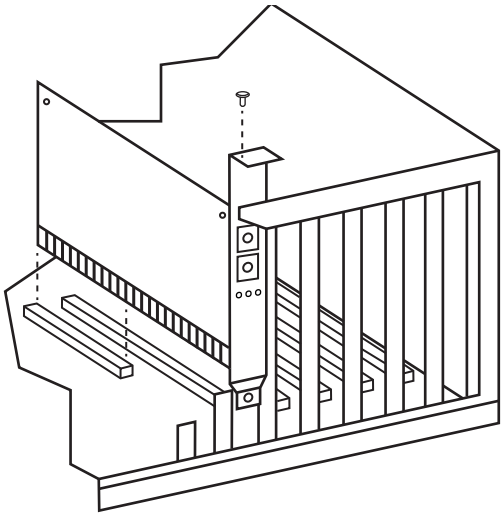

FIGURE 3-3. INSTALLING THE CARD IN A PCIE SLOT

6. Replace the system's cover and secure it with the screws removed in Step 2.

7. Disconnect any personal anti-static devices.

8. Power the system on.

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## 4.1 LED INDICATOR DESCRIPTION

The The table below describes the LED indicators and their functions.

TABLE 4-1. LED INDICATORS

| LED | COLOR | FUNCTION |
|---|---|---|
| Link/Act | Green | Lights when cable connection is good and speed is 1000 Mbps.<br>Blinks when traffic is present. |
| FDX | Green | Lights when full-duplex mode is active. |

## 4.2 WAKE ON LAN (WOL)

The Wake on LAN function on this adapter can recognize a wake-up frame and signal the PC to power up.

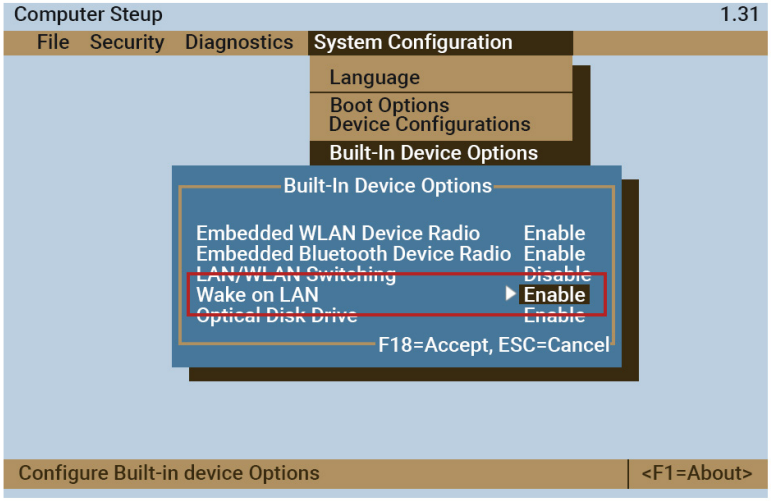


FIGURE 4-1. WAKE ON LAN VERIFY: BIOS SUPPORT SCREEN

If the PC's motherboard supports WOL and PCIe, the Wake up-Link connector is not necessary).

To disable the WOL function (Default): Set WOL jumper (J1) to the  OFF position.

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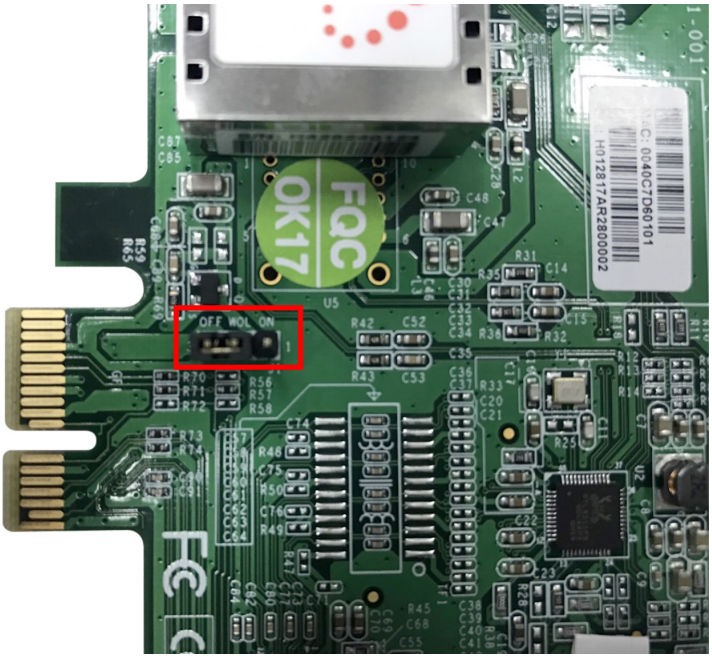


FIGURE 4-2. LOCATION OF JUMPER J1 ON THE ADAPTER

To enable the WOL function: Set the WOL jumper (J1) to the ON position.

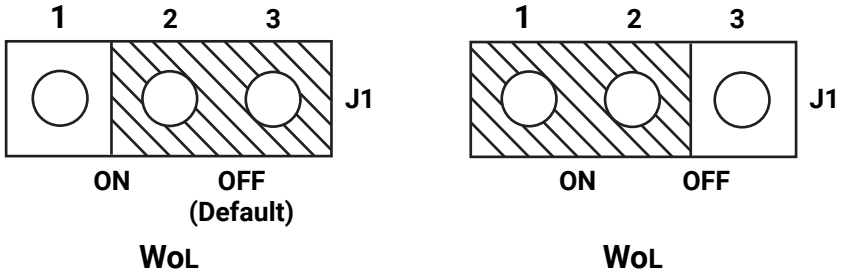


FIGURE 4-3. JUMPER J1 SETTINGS

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## NIC CONFIGURATION

1. Enter into the operating system's control panel.
2. From the Device Manager screen, configure the network adapters as shown in Figures 5-1 through 5-4.
3. Double-click on Realtek PCIe GBE Family Controller in the Device Manager screen.

FIGURE 5-1. DEVICE MANAGER SCREEN

4. The Properties screen appears.

4a. Select Shutdown Wake-on-LAN "Enabled" as shown in Figure 5-2.

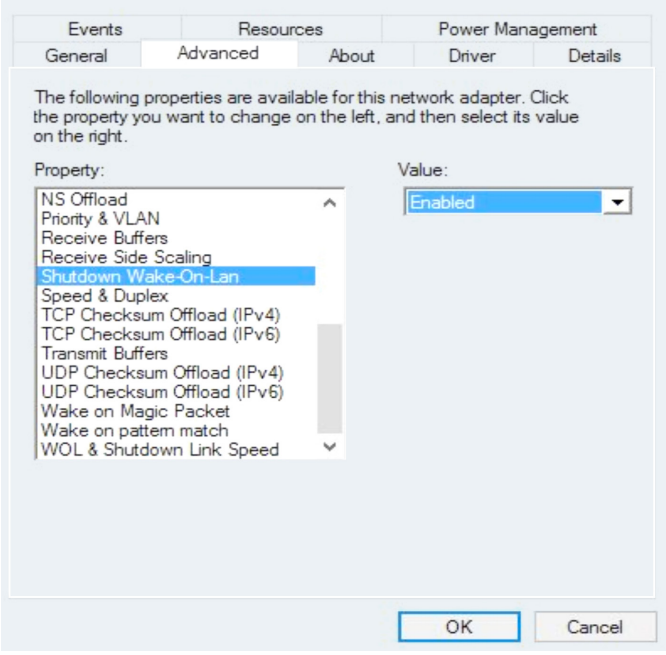


FIGURE 5-2. PROPERTIES SCREEN

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OR

4b. Select WOL & Shutdown Link Speed “No Speed Down“ as shown in Figure 5-3.

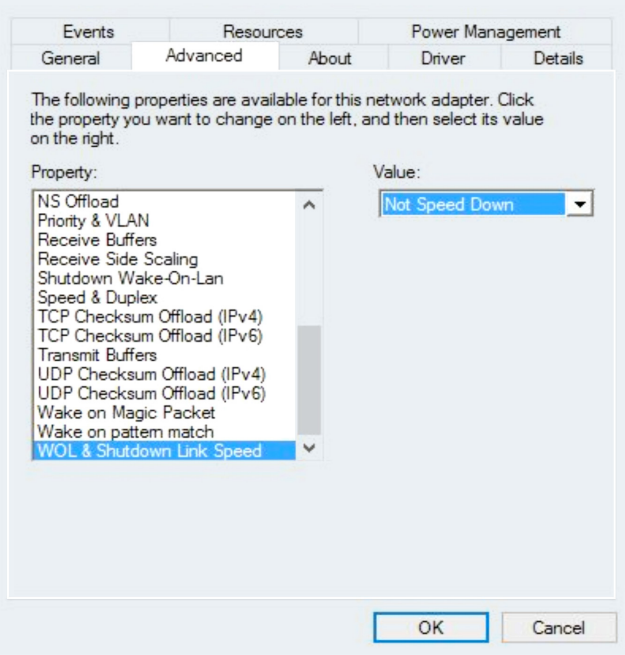


FIGURE 5-3. PROPERTIES SCREEN

5. Select the Power Management Setting.

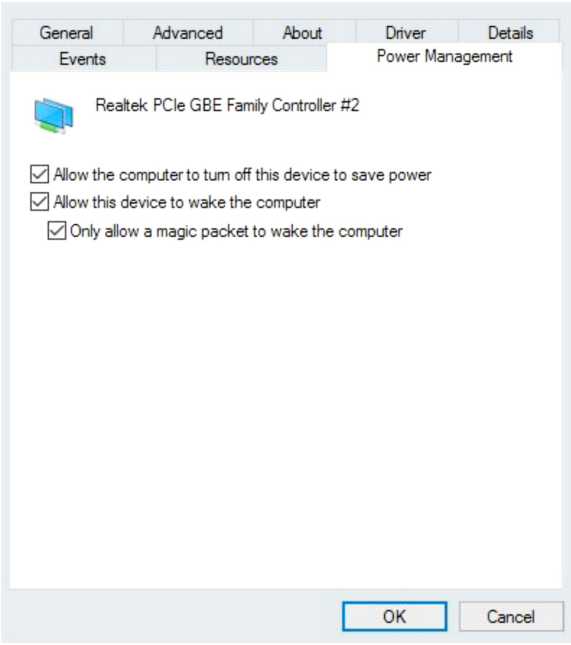


FIGURE 5-4. POWER MANAGEMENT TAB

# APPENDIX A: REGULATORY INFORMATION

## FCC STATEMENT

Class B Digital Device. This equipment has been tested and found to comply with the limits for a Class B computing device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. If this equipment does cause harmful interference to radio or telephone reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an experienced radio/TV technician for help.

CAUTION:

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

To meet FCC requirements, shielded cables and power cords are required to connect this device to a personal computer or other Class B certified device.

This digital apparatus does not exceed the Class B limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe B prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

# APPENDIX A: REGULATORY INFORMATION

## A.2 NOM STATEMENT

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc.
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.
12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
    - A: El cable de poder o el contacto ha sido dañado; u
    - B: Objectos han caído o líquido ha sido derramado dentro del aparato; o
    - C: El aparato ha sido expuesto a la lluvia; o
    - D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
    - E: El aparato ha sido tirado o su cubierta ha sido dañada.

# APPENDIX B: DISCLAIMER/TRADEMARKS

## B.1 DISCLAIMER

Black Box Corporation shall not be liable for damages of any kind, including, but not limited to, punitive, consequential or cost of cover damages, resulting from any errors in the product information or specifications set forth in this document and Black Box Corporation may revise this document at any time without notice.

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