LG-Nortel ELO ES24
(LNES24)

Fast Ethernet Switch

User Guide

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LG-NORTEL Co.Ltd.
GS Tower, 679 Yoksam-dong,
Kangnam-gu, Seoul, 135-985,Korea

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COMPLIANCES

FCC - Class A

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 in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with instructions, may cause harmful interference to radio communications. However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient 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 the dealer or an experienced radio/TV technician for help

Industry Canada - Class A

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled .Digital Apparatus,. ICES-003 of the Department of Communications.
Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouilleur: .Appareils Numériques,. NMB-003 édictée par le ministère des Communications.

EC Conformance Declaration - Class A

LG-NORTEL contact for these products is:
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    GS Tower, 679 Yoksam-dong,
    Kangnam-gu, Seoul, 135-985,Korea

This information technology equipment complies with the requirements of the Council Directive 89/336/EEC on the Approximation of the laws of the Member States relating to Electromagnetic Compatibility and 73/23/EEC for electrical equipment used within certain

voltage limits and the Amendment Directive 93/68/EEC. For the evaluation of the compliance with these Directives, the following standards were applied:

RFI Emission:

- Limit class A according to EN 55022:1998, IEC 60601-1-2 (EMC, medical)
- Limit class A for harmonic current emission according to EN 61000-3-2/1995
- Limitation of voltage fluctuation and flicker in low-voltage supply system according to EN 61000-3-3/1995

Immunity:

- Product family standard according to EN 55024:1998

- Electrostatic Discharge according to EN 61000-4-2:1995 (Contact Discharge: ±4 kV, Air Discharge: ±8 kV)
- Radio-frequency electromagnetic field according to EN 61000-4-3:1996 (80 - 1000 MHz with 1 kHz AM 80% Modulation: 3 V/m)
- Electrical fast transient/burst according to EN 61000-4-4:1995 (AC/DC power supply: ±1 kV, Data/Signal lines: ±0.5 kV)
- Surge immunity test according to EN 61000-4-5:1995 (AC/DC Line to Line: ±1 kV, AC/DC Line to Earth: ±2 kV)
- Immunity to conducted disturbances, Induced by radio-frequency fields: EN 61000-4-6:1996 (0.15 - 80 MHz with 1 kHz AM 80% Modulation: 3 V/m)
- Power frequency magnetic field immunity test according to EN 61000-4-8:1993 (1 A/m at frequency 50 Hz)
- Voltage dips, short interruptions and voltage variations immunity test according to EN 61000-4-11:1994 (>95% Reduction @10 ms, 30% Reduction @500 ms, >95% Reduction @5000 ms)

LVD:

- EN 60950-1:2001

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Please read the following safety information carefully before installing the Switch:

WARNING: Installation and removal of the unit must be carried out by qualified personnel only.

- This guide is intended for use by network administrators who are responsible for setting up and installing network equipment; consequently it assumes a basic working knowledge of LANs (Local Area Networks).
- The unit must be connected to an earthed (grounded) outlet to comply with international safety standards.
- Do not connect the unit to an A.C. outlet (power supply) without an earth (ground) connection.
- The appliance coupler (the connector to the unit and not the wall plug) must have a configuration for mating with an EN 60320/IEC 320 appliance inlet.
- The socket outlet must be near to the unit and easily accessible. You can only remove power from the unit by disconnecting the power cord from the outlet.
- This unit operates under SELV (Safety Extra Low Voltage) conditions according to IEC 60950. The conditions are only maintained if the equipment to which it is connected also operates under SELV conditions.

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France and Peru only
This unit cannot be powered from IT. supplies. If your supplies are of IT type, this unit must
be powered by 230 V (2P+T) via an isolation transformer ratio 1:1, with the secondary connection
point labelled Neutral, connected directly to earth (ground).
†Impédance à la terre

Power Cord Set	
U.S.A. and Canada	The cord set must be UL-approved and CSA certified.
	The minimum specifications for the flexible cord are: - No. 18 AWG - not longer than 2 meters, or 16 AWG. - Type SV or SJ - 3-conductor
	The cord set must have a rated current capacity of at least 10A.
	The attachment plug must be an earth-grounding type with NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.
Denmark	The supply plug must comply with Section 107-2-D1, Standard DK2-1a or DK2-5a.
Switzerland	The supply plug must comply with SEV/ASE 1011.
U.K.	The supply plug must comply with BS1363 (3-pin 13 A) and be fit-ted with a 5 A fuse which complies with BS1362.
	The mains cord must be <HAR> or <BASEC> marked and be of type HO3VVF3GO.75 (minimum).
Europe	The supply plug must comply with CEE7/7 (.SCHUKO.).
	The mains cord must be <HAR> or <BASEC> marked and be of type HO3VVF3GO.75 (minimum).
	IEC-320 receptacle.

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Warnings and Cautionary Messages

Warning: This product does not contain any serviceable user parts.

Warning: Installation and removal of the unit must be carried out by qualified personnel only.

Warning: When connecting this device to a power outlet, connect the field ground lead on the tri-pole power plug to a valid earth ground line to prevent electrical hazards.

Caution: Wear an anti-static wrist strap or take other suitable measures to prevent electrostatic discharge when handling this equipment.

Caution: Do not plug a phone jack connector in the RJ-45 port. This may damage this device. Les raccordeurs ne sont pas utilisé pour le système téléphonique!

Caution: Use only twisted-pair cables with RJ-45 connectors that conform to FCC standards.

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Environmental Statement

The manufacturer of this product endeavours to sustain an environmentally-friendly policy throughout the entire production process. This is achieved though the following means:

- Adherence to national legislation and regulations on environmental production standards.
- Conservation of operational resources.
- Waste reduction and safe disposal of all harmful un-recyclable by-products.
- Recycling of all reusable waste content.
- Design of products to maximize recyclables at the end of the product's life span.
- Continual monitoring of safety standards.

End of Product Life Span
This product is manufactured in such a way as to allow for the recovery and disposal of all included electrical components once the product has reached the end of its life.

Manufacturing Materials
There are no hazardous nor ozone-depleting materials in this product.

Documentation
All printed documentation for this product uses biodegradable paper that originates from sustained and managed forests. The inks used in the printing process are non-toxic.

Purpose
This guide details the hardware features of the switch, including its physical and performance-related characteristics, and how to install the switch.

Audience
The guide is intended for use by network administrators who are responsible for installing and setting up network equipment; consequently, it assumes a basic working knowledge of LANs (Local Area Networks).
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TABLE OF CONTENTS

INTRODUCTION

The LNES24 is a 24-port Fast Ethernet switch. The 10BASE-T/100BASE-TX ports deliver dedicated 10/100 Mbps links to each attached LAN segment – all with conventional cabling and adapters.

Auto-negotiation is used to select the optimal communication mode for each connection. Auto-sensing is used to select the optimal transmission speed for each connection. With store-and-forward switching and flow control, maximum data integrity is always maintained, even under heavy loading. Easy installation and reliability make this plug-and-play switch an ideal choice for smooth Fast Ethernet integration.

Features and Benefits

- Auto-negotiation of half or full duplex, and auto-sensing of transmission speed, on all ports

- Auto configuration for MDI/MDI-X cable connection allows connections to servers, workstations, hubs or switches to be made with straight-through cabling

- ANSI/IEEE 802.3u compliance ensures compatibility with standards-based hubs, switches and cards from any vendor

- Store-and-forward switching ensures error-free transmission

- Half- and full-duplex flow control prevents packets from being dropped under heavy loading

- Plug-and-play

- "At-a-glance" LEDs for port and system status monitoring

- Desktop and rack mountable

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Front Panel LEDs

The front panel of the switch provides a link status LED for each RJ-45 port. In addition, the front panel also contains status LEDs for "at-a-glance" system monitoring. The following table details the functions of the various indicators:

Port and Switch Status LEDs		
LED	**Condition**	**Status**
Power	On Green	The switch is receiving power.
Ports		
Link/Act	On	The port has established a valid network connection.
	Flashing	Traffic is passing through the port.
	Off	The port has not established any network connection.
10/100	On	Indicates the port is operating at 100Mbps
	Off	Indicates the port is operating at 10 Mbps.

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Front Panel

Rear Panel

The AC power connector is located on the rear panel of the switch.

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INSTALLING THE SWITCH

Before installing the switch, verify that you have all the items listed under
"Package Contents." Note that the switch can be installed on any suitably
large flat surface or in a standard EIA 19-inch rack.

Package Contents

The Switch 10/100 includes:
- LNES24 Fast Ethernet Switch
- Four rubber foot pads
- Rack-mount bracket kit
- Appropriate AC power cord
- This User Guide

Selecting a Site

Be sure to follow the site selection guidelines below when choosing a
location:
- Select a suitable location for the switch:
  - It should be accessible for installing, cabling and maintaining the
    switch.

  - The temperature and humidity should be within the ranges listed
    in the specifications.

  - The status LEDs should be clearly visible.

  - There should be adequate space (approximately two inches) on all
    sides for proper air flow.

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- Make sure twisted-pair cable is always routed away from power lines, fluorescent lighting fixtures and other sources of electrical interference such as radios, transmitters, etc.
- Make sure that a properly grounded power outlet is within 2.44 meters (8 feet) of the switch and is powered from an independent circuit breaker. As with any equipment, using a filter or surge suppressor is recommended.

Instructions

1. **Positioning the Switch:** For desktop or shelf mounting, attach the four adhesive foot pads to the bottom of the switch. For rack- mounting, attach the mounting brackets on both sides of the screws provided, and install the switch in the rack.

2. **Applying Power:** Plug one end of the power adapter into the power receptacle at back of the switch, and the other end into an appropriate electrical outlet. Check the Power LED to be sure power is on.

Note: It is not necessary to power off the switch before connecting or disconnecting any UTP cables, as these actions will not disrupt the operation of other devices attached to the switch.

3. **Connecting PCs:** Connect each PC to an RJ-45 port on the switch using Category 5 or 5e shielded or unshielded twisted-pair (UTP or STP) cable, maximum length 100 meters (328 ft). LNES24 will support up to 24 PCs. All ports on the switch support automatic MDI/MDI-X operation, so you can use straight-through cables for all network connections to PCs or servers, or to other switches or hubs.

Note: If an attached device does not support auto-negotiation, the data rate will be sensed automatically and the communication mode will default to half duplex.

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4. Cascading Switches and Other Network Devices: All the ports on the switch support automatic MDI/MDI-X configuration for cable connections. This allows you to use straight-through cable to connect to other switches or hubs from any port on the switch. No crossover cables or other device settings are needed. See the Cable Specifications.

Caution: Do not plug a phone jack connector into any RJ-45 port. This the switch. Instead, use only twisted-pair cables with RJ-45 connectors that conform with FCC standards.

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TROUBLESHOOTING

Diagnosing Switch Indicators

1. Symptom

Power LED does not light after power on.

    Probable Causes
- o   AC power cord may be defective.

    Possible Solutions
- o   Check for loose connections.
- o   Check the power outlet by using it for another device.
- o   Replace the AC power cord.

2. Symptom

Link LED does not light after connection is made.

    Probable Causes
- o   Switch port, network card or cable may be defective.

    Possible Solutions
- o   Check that the switch and attached device are both powered on.
- o   Be sure the network cable is connected to both devices.
- o   Verify that Category 5 or better cable is used for 10/100 Mbps connections and that the length of any cable does not exceed 100 meters (328 feet).
- o   Check the network card and cable connections for defects.
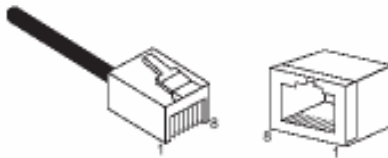- o   Replace the defective card or cable if necessary.

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CABLES

Cable Specifications

Cable Types and Specifications			
Cable	**Type**	**Max. Length**	**Connector**
10BASE-T	2-pair Cat. 3 or better 100-ohm UTP	100 m (328 ft)	RJ-45
100BASE-TX	2-pair Cat. 5 or better 100-ohm UTP	100 m (328 ft)	RJ-45

10BASE-T/100BASE-TX Pin Assignments

Caution: **DO NOT** plug a phone jack connector into any RJ-45 port. Use only twisted-pair cables with RJ-45 connectors that conform with FCC standards.

Use unshielded twisted-pair (UTP) or shielded twisted-pair (STP) cable for RJ-45 connections: 100-ohm Category 3 or better cable for 10 Mbps connections or 100-ohm Category 5 or better cable for 100 Mbps connections. Also be sure that the length of any twisted-pair connection does not exceed 100 meters (328 feet).

Because all ports on this switch support automatic MDI/MDI-X operation, you can use straight-through cables for all network connections to PCs or servers, or to other switches or hubs. In straight-through cable, pins 1, 2, 3, and 6, at one end of the cable, are connected straight through to pins 1, 2, 3 and 6 at the other end of the cable.

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The table below shows the 10BASE-T/100BASE-TX MDI-X and MDI port pinouts.

Pin	MDI-X Signal Name	MDI Signal Name
1	Receive Data plus (RD+)	Transmit Data plus (TD+)
2	Receive Data minus (RD-)	Transmit Data minus (TD-)
3	Transmit Data plus (TD+)	Receive Data plus (RD+)
6	Transmit Data minus (TD-)	Receive Data minus (RD-)
4,5,7,8	Not used at 10/100 Mbps	Not used at 10/100 Mbps

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PRODUCT SPECIFICATIONS

LNES24 Fast Ethernet Switch

Standards Conformance
IEEE 802.3-2002
Ethernet, Fast Ethernet
Full-duplex flow control

Communication Rate
10 and 100Mbps

Communication Mode
Full or half duplex at 10/100 Mbps

Media Supported
10BASE-T: 100-ohm Category 3 or better twisted-pair
100BASE-TX: 100-ohm Category 5 or better twisted pair

Number of Ports
LNES24: 24 RJ-45 10/100 BASE-T ports

Indicator Panel
Power
Ports: Link/Act, 10/100M

Dimensions
28x17.3x4.4 cm (11x6.8x1.7 in.)

Weight
LNES24: 1.7 kg (3.7 lbs)

MAC Address Table
8 K entries

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Memory Buffer
LNES24: 1.25 Mbits on-chip frame buffer

Power Consumption
LNES24: 13 Watts

Power Requirement
Input Voltage: 100 - 240 VAC@50-60 Hz

Temperature
Operating: 0 ~ 50 ℃ / 32 ~ 122 ℉
Storage: -20 ~ 70 ℃ / -4 ~ 158 ℉

Humidity
5% to 95% non-condensing

EMC/Safety Compliances
CE Mark

Immunity
EN 61000-4-2/3/4/5/6/8/11

Emissions
FCC Class A, CISPR Class A, EN 61000-3-2/3

Safety
CSA/CUS (CSA60950-1 & UL60950-1)
TUV / GS EN60950-1
CB IEC60950-1

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