# LG-NØRTEL

# SpeedLIGHT16 / TurboLIGHT16
# ONT Unit NS 161XX
## (NS 16100 NN and NS 16 1G NN)

Please read this manual carefully before operating your set.
Retain it for future reference.

## >CONTENTS

**NS 16100NN**

**NS 16 1G NN**

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## > Product and personnel safety guidelines

This section contains safety guidelines that you must follow for personal safety and to operate the equipment correctly.
LG-Nortel documentation contains precautionary messages and safety procedures that refer to specific tasks or conditions. You must read and follow all precautionary messages before you start to work on the equipment.

## > Audience

Personnel working directly on equipment must be
• trained, authorized, and qualified to carry out the tasks required
• able to follow safety guidelines specific to the product and all local customer-specific safety procedures

## > Precautionary messages

To prevent personal injury, equipment damage, and service interruptions, you must follow all precautionary messages in Nortel documentation and all local safety standards required by your service provider.
The following precautionary messages appear in Nortel documentation:

**DANGER**
**Risk of personal injury**
A precautionary message with this symbol indicates a risk of personal injury.

**DANGER**
**Risk of electrical shock**
A precautionary message with this symbol indicates a risk of personal injury caused by an electrical hazard.

**WARNING**
**Risk of laser radiation exposure**
A precautionary message with this symbol indicates a potential risk of personal injury caused by exposure to a laser beam.

**CAUTION**
**Risk of laser radiation exposure**
A precautionary message with this symbol indicates a potential risk of personal injury caused by exposure to a laser beam.

## Safety standards

LG-Nortel products conform to all relevant safety standards. NS 161XX (NS 16100 NN and NS 16 1G NN) complies with the following safety standards:
• IEC/EN 60950-1:2001+A11:2004—Information technology equipment - Safety, Part 1 : General requirements
• IEC 60825-1:2001 and IEC 60825-2:2004—Safety of Laser Products
• FDA 21 CFR 1040—Performance Standards for Light-Emitting Products

## Laser radiation—eye safety hazards

LG-Nortel optical products use laser or light-emitting diode (LED) sources that emit light energy into optical fibers. This energy is within the red (visible) and infrared (not visible) areas of the electromagnetic spectrum. FDA 21 CFR 1040 Performance Standards for Light-Emitting Products

### Laser radiation hazards

When operating the product normally, with all optical connectors in position and correctly terminated, the optical radiation is completely enclosed. The system is a Class 1(IEC)/Class I (FDA) product, regardless of the power transmitted within the optical fiber.

If you have unterminated optical cables (breaks in the fiber-optic cable or disconnected connectors) the output from circuit packs containing optical transmitters does not exceed Class 1 (IEC)/Class I (FDA) and is therefore considered safe under all reasonably foreseeable conditions.

The following text includes additional information on the laser for the NS 161XX.

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**Laser wavelength 1524 - 1570 nm**
Maximum laser output power <= 5 mW
Standards: IEC 60825-1:2001 Edition 1.2

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## Using optical fibers

All activity described herein regarding the optical interface of the NS 161XX is intended only for trained personnel operating under the direction of the service provider. Users and homeowners should not attempt to access or disconnect the optical interface or damage the optical cable. Consult with the service provider before undertaking any action involving the optical interface.

## Handling optical fibers

When you work with optical fibers, you must take the following general precautions:
• Wear safety glasses when you install optical fibers.

**WARNING**
**Risk of laser radiation exposure**
Do not look directly into the optical beam. Invisible light can severely damage your eyes. Keep all optical connectors capped.

• Do not look into the opening of an optical fiber, or the opening of an optical fiber connector, if the optical fiber is active or the unit has the power turned on.
• Avoid direct exposure to optical fiber ends or optical connector ends where you can access the laser signal directly.
• Clean your hands after you handle optical fibers. Small pieces of glass are not always visible and can damage your eyes.

**DANGER**
**Risk of eye injury**
If you have a piece of a glass in your eye, get medical assistance immediately.

• Do not handle pieces of optical fiber with your fingers. Use tweezers or adhesive tape to lift and discard any loose optical fiber ends.
• Wear rubber gloves when you clean optical connectors. The gloves prevent direct contact with the isopropyl alcohol and prevent contamination of the ferrules with skin oils.
• Place all optical fiber clippings in a plastic container provided for that purpose.
• Handle optical fibers with caution. Place the optical fibers in a safe location during installation.
• Protect all optical fiber connectors with clean dust caps at all times.
• Follow the manufacturer instructions when you use an optical test set. Incorrect calibration or control settings can create hazardous levels of radiation.

## Splicing optical fibers

When you must look at a spliced optical fiber with a small magnifier, take the following precautions:
• Power off all laser sources to the optical fiber or disconnect the remote optical fiber end from the laser sources before you start splicing. Make sure that all laser sources remain disconnected or have the power turned off.
• Disconnect all optical test sets from the optical fiber before you start splicing. The connections can be local or remote.
• Use only the optical instruments approved by your company.

## Repairing optical fibers

When an accidental break occurs in the optical fiber, do the following:
• Report the location of the damaged optical fiber to both the service provider and the field repair personnel.
• Power down all laser sources to the optical fiber or disconnect the remote optical fiber end from the laser sources.

## Working with power

**DANGER**
**Risk of electrical shock**
The (AC) mains connection from the power adapter to the power supply can be a shock hazard. Read and understand the power procedures you are performing. Take necessary precautions and use the appropriate insulated tools when working with power.

## Other Warnings and cautions

### WARNINGS

Do not disassemble this product.
**This can cause poor performance of the product or result in a fire, or injury from electric shock. If you experience trouble, contact the service provider.**

Do not expose this product to liquid or install this product in a humid location. If the product does get wet, contact your service provider.
**This can cause poor performance of the product or result in a fire, or injury from electric shock.**

If the product has an abnormal smell, noise or if you see smoke, disconnect the power or turn it off if it safe to do so and contact your service provider.
**This can result in a fire, or injury from electric shock.**

### CAUTIONS

Keep the fiber connected at all times. Do not remove it.
**It is recommended that the fiber remains connected in your fiber port. This will reduce the possibility of dust confamination which would im pact perfomance.**

DO NOT pull on the optical cable.
**This can cause poor performance and failure of the product.**

Do not stack anything on this product.
**This can cause poor performance and failure of the product.**

DO NOT install the product in a dusty site.
**This can cause poor performance or reduced life cycle of the product.**

DO NOT install the product under direct sun rays or near heating appliances.
**This can cause poor performance and failure of the product.**

DO NOT install the product in a poor-ventilated site.
**This can cause poor performance or reduced life cycle of the product.**

Do not clean this product with any type of cleaning agents or water.
**This can damage the product. Use a dry, clean cloth to remove dust.**

Warranty: Customers can receive repair services for this product under specified conditions. This warranty does not cover failure or damage of the product caused from, using a  power adapter other than the one provided, PC failures, data loss, or negligent treatment of the product.

## ❯ Regulatory information

This chapter contains the following information:
• a list of global technical standards (electromagnetic compatibility, safety) to which
the NS 161XX(NS 16100 NN and NS 16 1G NN) complies
• a country-by-country list of specific regulatory text required by national authorities
• information on the regulatory labels affixed to the product (artwork and location
on the product)

The list of global technical standards provided in this chapter is not exhaustive.
The standards listed are generally regarded as the primary applicable
electromagnetic compatibility (EMC) and safety standards. The conformity status
on additional national and international standards not listed in this section can be
provided upon request.

## ❯ Compliance to applicable technical standards and regulations

The NS 161XX meets or exceeds the following standards and requirements:
• (CFR Title 47, Chapter 1) FCC Part 15, Subpart B, Class B (USA)
• ICES-003, Issue 4, Class B (Canada)
• European Union EMC Directive (2004/108/EC)
• European "Low Voltage" Directive (2006/95/EC)
• EN 55022:2006 - Class B (European Community, Australia and New Zealand)
• EN 55024:1998 +A1:2001 +A2:2003 (European Community)
• EN 300 386 V1.3.3 (European Community, Australia and New Zealand)
• Australian Radiocommunications Labelling (Electromagnetic Compatibility) Notice
2008
• CAN/CSA-C22.2 No. 60950-1 (Canada)
• UL Std No. 60950-1 (USA)
• IEC/EN 60950-1:2001+A11:2004 (European Community)
• IEC/EN 60825-1:2001
• IEC/EN 60825-2:2004

## ❯ Country-specific regulatory information

### ❯ Canada

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

### ❯ United States of America

This equipment has been tested and found to comply with the limits for a Class B 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 the instructions, may cause harmful interference to radio communications. However, there is no guarantee that 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 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 with the service provider before proceeding).
• Consult the service provider or an experienced radio/TV technician for help.

Repairs to certified equipment should be coordinated by a representative designated by your service provider. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the service provider cause to request the user to disconnect the equipment.

Do not attempt to repair this equipment. If you experience trouble, contact the service provider.

## › European Union

The NS 161XX conforms with the essential requirements of Directive 2004/108/EC (EMC Directive), Directive 2006/95/EC (Low Voltage Directive) compliance to the following harmonized standards:

• EN 55022:2006 (Class B)
• EN 55024:1998 +A1:2001 +A2:2003
• EN 300 386 V1.3.3 (Class B, other than telecommunications centres criteria)
• EN 60950-1:2001 +A11:2004
• EN 60825-1:2001
• EN 60825-2:2004

The product bears the CE mark as illustrated in the Figure on page 13.
A signed Declaration of Conformity is available upon request.

## › Regulatory labels (Safety and EMC)

The following labels have been placed on the system and various field replaceable units (FRU).

The main product-level regulatory label is located on the bottom of the NS 161XX. See the Figure on page 13. The label bears the product name, power ratings information, certification and other regulatory marks and informational disclosures required by jurisdictional authorities.

**After reading through this User's Manual, please keep it handy for easy reference.**

# › About NS 161XX (NS 16100 NN and NS 16 1G NN)

Thank you for selecting LG-Nortel (NS 161XX NS 16100 NN and NS 16 1G NN). The NS 16 100 NN and NS 16 1G NN are ONT equipment which are located at the Customer premises end of a SpeedLIGHT16 or TurboLIGHT16 WDM-PON (Wavelength Division Multiplexing - Passive Optical Network) system.

The NS 16100 NN converts 125Mbps Fast Ethernet signal into WDM-PON optical signal which is transmitted to OLT through remote node that is consisted of AWG (Arrayed Waveguide Grating) and getting WDM-PON optical signal from the RN to convert into 125 Mbps Fast Ethernet signal.
The NS 16 1G NN converts 1.25 Gbps Gigabit Ethernet signal into WDM-PON optical signal which is transmitted to OLT through RN and getting WDM-PON optical signal from the RN in convert into 1.25 Gbps Gigabit Ethernet signal.
These products will allow you to use the different services such as VoD (Video on Demand), EoD (Education on Demand), IP-TV and High speed internet access available from your provider.
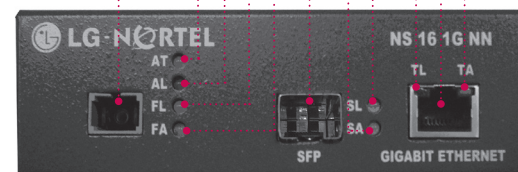
# › Unit Description

## › NS 161XX Product front view



■ NS 16100 NN
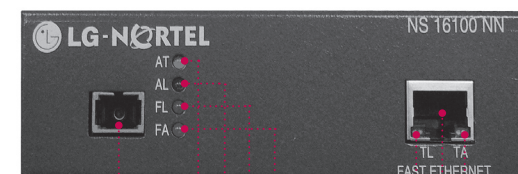
■ NS 16 1G NN

## NS 161XX Front LED and Descriptions

| Number | LED | Color | Status | Description |
|---|---|---|---|---|
| ① | AT | Green | On | Is lit when link is active |
| ② | AL | Red | On | Is lit when alarm occurs |
| ③ | FL | Green | On | Is lit when optical link is connected to service provider through SL16 / TL16 system |
| ④ | FA | Yellow | On | Is lit and blink when the device sends/receives data to/from equipment of the service provider through SL16 / TL16 system |
| ⑤ | TL | Orange | On | Is lit when Ethernet link is connected |
| ⑥ | TA | Green | On | Is lit and blink when the device sends/receives data to/from equipment of the service provider. |
| ⑦ | SL | Green | On | Is lit when SFP optical link is connected (NS 16 1G NN only) |
| ⑧ | SA | Yellow | On | Is lit and blink when the device sends/receives data to/from equipment that is connected by SFP (NS 16 1G NN only) |

## NS 161XX Front Panel Port Descriptions

| Number | Port | Type | Description |
|---|---|---|---|
| ⑨ | Optical port | SC/APC Adaptor | This port (optical) should be accessed only by the service provider. It is the access point to the service provider's network. |
| ⑩ | Ethernet port | RJ-45 | This port is Ethernet port that will connect to user devices supporting 10/100 Mbps by NS 16100 NN and 10/100/1000 Mbps by NS 16 1G NN |
| ⑪ | SFP port | SFP connector | This port to be connected other Ethernet equipments by SFP optical module (NS 16 1G NN only) |

## NS 161XX with lables
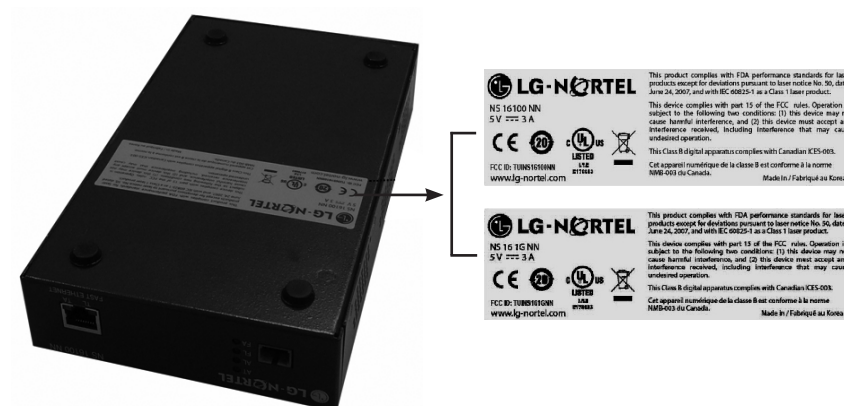


## Specifications of NS 161XX

| Item | Specification |
|---|---|
| Dimensions in mm | 125(w) x 215(d) x 40(h) |
| Power | DC 5V, 3A |
| Ambient Temperature | 0℃ to 50℃ |
| Humidity | 20% to 80% |
| Technical standards | EN 300 386 (Class B, other then Telecom Centres) FCC part 15 (CFR 47) (Class B) EN 55022 (Class B) / 55024 |
| Data rate | 100Mbps (NS 16100 NN) 1Gbps (NS 161G NN) |
| Connectors | SC/APC (optical), RJ45 (Ethernet) |
| LED indicators | Link status, Alarm, optical port status, Ethernet port status |

## > Checking package contents

Before installing this product, ensure all parts are provided.

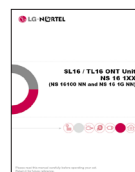Check the package to make sure the following items are included.

NS 161XX Main body

AC/DC Power adaptor

Power cable

User manual

## > Installing NS 161XX

This section provides the specifications for NS 161XX installation, it also describes how to install it and connect it into a network.

### > Installation environments

Install the NS 161XX in an environment where the following specifications are met.

》 Operating temperature: 0℃ to 50℃

》 Relative humidity: 20% to 80%

》 Input voltage: 5V DC Power, 3A

### > Preparing for installation

Before you install the NS 161XX, review following information.

| Item | Quantity | Supplied |
|---|---|---|
| Main body of NS 161XX | 1 | yes |
| Ethernet (RJ-45) cable for network access | as required | no |
| DC / AC Power Adaptor | 1 | yes |
| AC Power cable | 1 | yes |
| Optical fiber (SC/APC) | 1 | no |

### Note

Power cables differ by country in shape, size and type of connectors.
Check the 'Pec Code' on the label of the envelope.

| Pec Code | Country |
|---|---|
| Q03110ONTPCKOR | KOREA |
| Q03111ONTPCUSA | USA |
| Q03112ONTPCEU | EUROPE |
| Q03113ONTPCAUS | AUSTRALIA |
| Q03114ONTPCENG | ENGLAND |

## > Grounding

STEP 1: Unfasten the grounding screw on the rear side of the NS 161XX.
STEP 2: Attach the 1-hole lug using the screw that was removed in STEP 1.

The grounding connection is suitable for terminating a #18 AWG wire.



Grounding screw

## >> Connecting power cable

Lift up the cable retaining clip and connect the AC power cable.
Pull down the cable retaining clip to lock in the power cable.
The AC power cable must comply with "IEC60320 C14"



Cable retaining clip          Power connection
                              to power adaptor
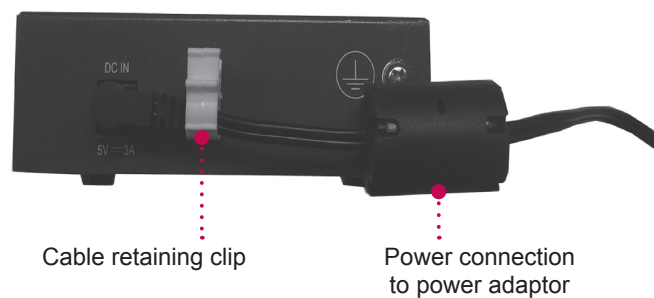
## >> Connecting optical cable

Check that the power switch on the NS 161XX is in the off position. Insert the SC APC connector into the optical port of the NS 161XX. Insert the other end of the APC optical cable into the optical outlet on your wall.



Connector

SC APC

Optical cable
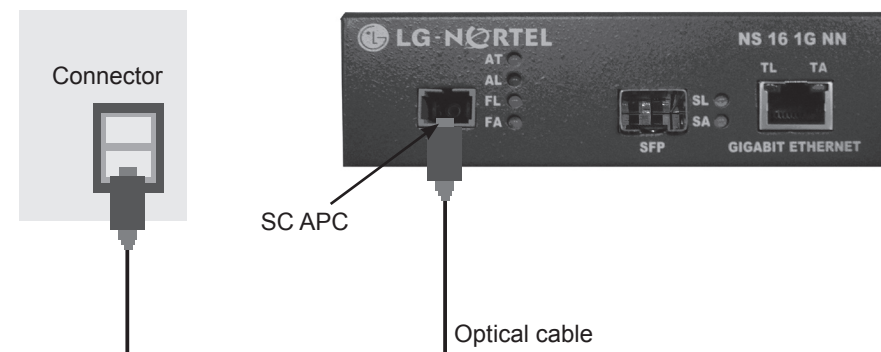
### CAUTION
Only SC APC connector should be used. Other connector types will not work properly.

## >> Connecting Ethernet cable

Connect Ethernet cables to the RJ45 Ethernet port in NS 161XX.
Connect the other side of the Ethernet cable to the Ethernet port of your home device.

## ❯ Checking the connection status

### ❯❯ Checking the connection status of service provider line (Link)

When the NS 161XX is first powered on, the AL LED should turn red momentarily. Once communication is established this LED turns off. The AT LED should turn green and blink.



AL LED          AT LED

### ❯❯ Checking the connection status of user devices

When NS 161XX is power-fed, the Green LED for TL and Orange LED for TA should be on.
The green LED on TL is the data indicator. It blinks when data is being transmitted or received.
The orange LED on TA is the link indicator.

## ❯ Setting NS 161XX

When you select to receive WDM-PON service, you do not have to make additional settings on the product to use it.

### ❯ Using Internet

With a web browser such as the Internet Explorer on your PC, you can surf freely through the Internet.

📎 **Note**

NS 161XX does not require any access program.
Use your regular internet browser.