



# **7368 Intelligent Services Access Manager ONT**

## **7368 ISAM ONT E-240G-B Product Guide**

**3FE-46261-AAAA-TCZZA**

**Issue: 01**

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# 1 Preface

This preface provides general information about the documentation set for optical network terminals (ONUs).

## 1.1 Scope

This documentation set provides information about safety, features and functionality, ordering, hardware installation and maintenance, and software installation procedures for the current release.

## 1.2 Audience

This documentation set is intended for planners, administrators, operators, and maintenance personnel involved in installing, upgrading, or maintaining the ONUs.

## 1.3 Required knowledge

The reader must be familiar with general telecommunications principles.

## 1.4 Acronyms and initialisms

The expansions and optional descriptions of most acronyms and initialisms appear in the glossary.

## 1.5 Assistance and ordering phone numbers

Nokia provides global technical support through regional call centers. Phone numbers for the regional call centers are available at the following URL:  
<http://support.alcatel-lucent.com>.

For ordering information, contact your Nokia sales representative.

## 1.6 Nokia quality processes

Nokia's ONU quality practices are in compliance with TL 9000 requirements. These requirements are documented in the Fixed Networks Quality Manual 3FQ-30146-6000-QRZZA. The quality practices adequately ensure that technical requirements and customer end-point requirements are met. The customer or its representatives may be allowed to perform on-site quality surveillance audits, as agreed upon during contract negotiations.

## 1.7 Safety information

For safety information, see the appropriate safety guidelines chapter.

## 1.8 Documents

Documents are available using ALED or OLCS.

### Procedure 1 To download a ZIP file package of the customer documentation

- 1 Navigate to <http://support.alcatel-lucent.com> and enter your user name and password. If you are a new user and require access to this service, please contact your Nokia sales representative.
  - 2 From the Technical Content for drop-down menu, choose the product.
  - 3 Click on Downloads: Electronic Delivery.
  - 4 Choose Documentation from the drop-down menu and click Next.
  - 5 Select the image from the drop-down menu and click Next.
  - 6 Follow the on-screen directions to download the file.
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## Procedure 2 To access individual documents

Individual PDFs of customer documents are also accessible through the Nokia Customer Support website.

- 1 Navigate to <http://support.alcatel-lucent.com> and enter your user name and password. If you are a new user and require access to this service, please contact your Nokia sales representative.
  - 2 From the Technical Content for drop-down menu, choose the product.
  - 3 Click on Manuals and Guides to display a list of customer documents by title and part number. You can filter this list using the Release drop-down menu.
  - 4 Click on the PDF to open or save the file.
- 

## 1.9 Special information

The following are examples of how special information is presented in this document.



**Danger** — Danger indicates that the described activity or situation may result in serious personal injury or death; for example, high voltage or electric shock hazards.



**Warning** — Warning indicates that the described activity or situation may, or will, cause equipment damage or serious performance problems.



**Caution** — Caution indicates that the described activity or situation may, or will, cause service interruption.



**Note** — A note provides information that is, or may be, of special interest.

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## 1.9.1 Procedures with options or substeps

When there are options in a procedure, they are identified by letters. When there are required substeps in a procedure, they are identified by roman numerals.

### Procedure 3 Example of options in a procedure

At step 1, you can choose option a or b. At step 2, you must do what the step indicates.

- 
- |   |   |
|---|---|
| 1 | This step offers two options. You must choose one of the following: |
| a | This is one option.   |
| b | This is another option.   |
- 

- |   |                             |
|---|-----------------------------|
| 2 | You must perform this step. |
|---|-----------------------------|
- 

### Procedure 4 Example of required substeps in a procedure

At step 1, you must perform a series of substeps within a step. At step 2, you must do what the step indicates.

- 
- |     |   |
|-----|---|
| 1   | This step has a series of substeps that you must perform to complete the step. You must perform the following substeps: |
| i   | This is the first substep.  |
| ii  | This is the second substep.   |
| iii | This is the third substep.  |
- 

- |   |                             |
|---|-----------------------------|
| 2 | You must perform this step. |
|---|-----------------------------|
-

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## 1.10 Multiple PDF document search

You can use Adobe Reader Release 6.0 and later to search multiple PDF files for a common term. Adobe Reader displays the results in a single display panel. The results are grouped by PDF file, and you can expand the entry for each file.



**Note** — The PDF files in which you search must be in the same folder.

### Procedure 5 To search multiple PDF files for a common term

- 
- 1 Open Adobe Acrobat Reader.

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  - 2 Choose Edit→Search from the Acrobat Reader main menu. The Search PDF panel appears.

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  - 3 Enter the search criteria.

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  - 4 Click on the All PDF Documents In radio button.

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  - 5 Select the folder in which to search using the drop-down menu.

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  - 6 Click on the Search button.

Acrobat Reader displays the search results. You can expand the entries for each document by clicking on the + symbol.

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## 2 ETSI environmental and CRoHS guidelines

This chapter provides information about the ETSI environmental China Restriction of Hazardous Substances (CRoHS) regulations that govern the installation and operation of the optical line termination (OLT) and optical network unit (ONU) systems. This chapter also includes environmental operation parameters of general interest.

### 2.1 Environmental labels

This section describes the environmental instructions that are provided with the customer documentation, equipment, and location where the equipment resides.

#### 2.1.1 Overview

CRoHS is applicable to Electronic Information Products (EIP) manufactured or sold and imported in the territory of the mainland of the People's Republic of China. EIP refers to products and their accessories manufactured by using electronic information technology, including electronic communications products and such subcomponents as batteries and cables.

#### 2.1.2 Environmental related labels

Environmental labels are located on appropriate equipment. The following are sample labels.

##### 2.1.2.1 Products below Maximum Concentration Value (MCV) label

Figure 1 shows the label that indicates a product is below the maximum concentration value, as defined by standard SJ/T11363-2006 (Requirements for Concentration Limits for Certain Hazardous Substances in Electronic Information Products). Products with this label are recyclable. The label may be found in this documentation or on the product.

**Figure 1**      **Products below MCV value label**



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### **2.1.2.2    Products containing hazardous substances above Maximum Concentration Value (MCV) label**

Figure 2 shows the label that indicates a product is above the maximum concentration value, as defined by standard SJ/T11363-2006 (Requirements for Concentration Limits for Certain Hazardous Substances in Electronic Information Products). The number contained inside the label indicates the Environment-Friendly User Period (EFUP) value. The label may be found in this documentation or on the product.

**Figure 2**      **Products above MCV value label**

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Together with major international telecommunications equipment companies, Nokia has determined it is appropriate to use an EFUP of 50 years for network infrastructure equipment and an EFUP of 20 years for handsets and accessories. These values are based on manufacturers' extensive practical experience of the design, manufacturing, maintenance, usage conditions, operating environments, and physical condition of infrastructure and handsets after years of service. The values reflect minimum values and refer to products operated according to the intended use conditions. See "[Hazardous Substances Table \(HST\)](#)" for more information.

## 2.2 Hazardous Substances Table (HST)

This section describes the compliance of the OLT and ONU equipment to the CRoHS standard when the product and sub-assemblies contain hazardous substances beyond the MCV value. This information is found in this user documentation where part numbers for the product and sub-assemblies are listed. It may be referenced in other OLT and ONU documentation.

In accordance with the People's Republic of China Electronic Industry Standard Marking for the Control of Pollution Caused by Electronic Information Products (SJ/T11364-2006), customers may access the Nokia Hazardous Substance Table, in Chinese, from the following location:

- <http://www.alcatel-sbell.com.cn/wwwroot/images/upload/private/1/media/ChinaRoHS.pdf>

If clicking the link does not work, copy the link and paste it into your browser.

## **2.3 Other environmental requirements**

Observe the following environmental requirements when handling the P-OLT or ONU equipment.

### **2.3.1 ONU environmental requirements**

See the ONU technical specification documentation for more information about temperature ranges.

### **2.3.2 Storage**

According to ETS 300-019-1-1 - Class 1.1, storage of OLT equipment must be in Class 1.1, weather-protected, temperature-controlled locations.

### **2.3.3 Transportation**

According to EN 300-019-1-2 - Class 2.3, transportation of the OLT equipment must be in packed, public transportation with no rain on packing allowed.

### **2.3.4 Stationary use**

According to EN 300-019-1-3 - Class 3.1/3.2/3.1E, stationary use of OLT equipment must be in a temperature-controlled location, with no rain allowed, and with no condensation allowed.

### **2.3.5 Thermal limitations**

When the OLT is installed in the CO or CEV, install air filters on the P-OLT. The thermal limitations for OLT operation in a CO or CEV are:

- operating temperature: 5°C to 40°C (41°F to 104°F)
- short-term temperature: –5°C to 50°C (23°F to 122°F)
- operating relative humidity: 5% to 85%
- short-term relative humidity: 5% to 95%, but not to exceed 0.024 kg of water/kg

## 2.3.6 Material content compliance

European Union (EU) Directive 2002/95/EC, “Restriction of the use of certain Hazardous Substances” (RoHS), restricts the use of lead, mercury, cadmium, hexavalent chromium, and certain flame retardants in electrical and electronic equipment. This Directive applies to electrical and electronic products placed on the EU market after 1 July 2006, with various exemptions, including an exemption for lead solder in network infrastructure equipment. Nokia products shipped to the EU after 1 July 2006 comply with the EU RoHS Directive.

Nokia has implemented a material/substance content management process. The process is described in: Nokia process for ensuring RoHS Compliance (1AA002660031ASZZA). This ensures compliance with the European Union Directive 2011/65/EU on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS2). With the process equipment is assessed in accordance with the Harmonised Standard EN50581:2012 (CENELEC) on Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

## 2.3.7 End-of-life collection and treatment

Electronic products bearing or referencing the symbol shown in Figure 3, when put on the market within the European Union (EU), shall be collected and treated at the end of their useful life, in compliance with applicable EU and local legislation. They shall not be disposed of as part of unsorted municipal waste. Due to materials that may be contained in the product, such as heavy metals or batteries, the environment and human health may be negatively impacted as a result of inappropriate disposal.



**Note** — In the European Union, a solid bar under the symbol for a crossed-out wheeled bin indicates that the product was put on the market after 13 August 2005.

**Figure 3** Recycling/take back/disposal of product symbol



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At the end of their life, the OLT and ONU products are subject to the applicable local legislations that implement the European Directive 2012/19EU on waste electrical and electronic equipment (WEEE).

There can be different requirements for collection and treatment in different member states of the European Union.

In compliance with legal requirements and contractual agreements, where applicable, Nokia will offer to provide for the collection and treatment of Nokia products bearing the logo shown in Figure 3 at the end of their useful life, or products displaced by Nokia equipment offers. For information regarding take-back of equipment by Nokia, or for more information regarding the requirements for recycling/disposal of product, contact your Nokia account manager or Nokia take back support at [sustainability.global@nokia.com](mailto:sustainability.global@nokia.com).

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## 3 ETSI ONU safety guidelines

This chapter provides information about the mandatory regulations that govern the installation and operation of the optical network units (ONUs).

### 3.1 Safety instructions

This section describes the safety instructions that are provided in the ONU customer documentation and on the equipment.

#### 3.1.1 Safety instruction boxes

The safety instruction boxes are provided in the ONU customer documentation. Observe the instructions to meet safety requirements.

The following is an example of the Danger box.



**Danger** — Possibility of personal injury.

The Danger box indicates that the described activity or situation may pose a threat to personal safety. It calls attention to a situation or procedure which, if not correctly performed or adhered to, may result in death or serious physical harm.

Do not proceed beyond a Danger box until the indicated conditions are fully understood and met.

The following is an example of the Warning box.




**Warning 1** — Possibility of equipment damage.

**Warning 2** — Possibility of data loss.

The Warning box indicates that the described activity or situation may, or will, cause equipment damage, loss of data, or serious performance problems. It identifies a possible equipment-damaging situation or provides essential information to avoid the degradation of system operations or data.

Do not proceed beyond a warning until the indicated conditions are fully understood and met.

The following is an example of the Caution box.




**Caution 1** — Possibility of service interruption.

**Caution 2** — Service interruption.

The Caution box indicates that the described activity or situation may, or will, cause service interruption.

Do not proceed beyond a caution until the indicated conditions are fully understood and met.

The following is an example of the Note box.



**Note** — Information of special interest.

The Note box provides information that assists the personnel working with ONUs. It does not provide safety-related instructions.

### 3.1.2 Safety-related labels

The ONU equipment is labeled with the specific safety instructions and compliance information that is related to a variant of the ONU. Observe the instructions on the safety labels.

Table 1 provides sample safety labels on the ONU equipment.


**Table 1**      **Safety labels**

Description	Label text
ESD warning	Caution: This assembly contains an electrostatic sensitive device.
Laser classification	Class 1 laser product
PSE marking	These power supplies are Japan PSE certified and compliant with Japan VCCI emissions standards.

Figure 4 shows the PSE certification.



**Figure 4 PSE certification**

 Warning	This is a Class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.
警告	VCCI準拠クラスB機器（日本） この機器は、Information Technology EquipmentのVoluntary Control Council for Interference（VCCI）の規格に準拠したクラスB製品です。この機器をラジオやテレビ受信機の近くで使用した場合、混信が発生する恐れがあります。本機器の設置および使用に際しては、取扱説明書に従ってください。

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## 3.2 Safety standards compliance

This section describes the ONU compliance with the European safety standards.

### 3.2.1 EMC, EMI, and ESD compliance

The ONU equipment complies with the following EMC, EMI, and ESD requirements:

- EN 300-386 V1.6.1: Electromagnetic Compatibility and Radio Spectrum Matters (ERM): Telecommunications Network Equipment; Electromagnetic Compatibility (EMC) requirements; Electrostatic Discharge (ESD) requirements
- EN 55022 (2006): Class B, Information Technology Equipment, Radio Disturbance Characteristics, limits and methods of measurement
- EN 55024 (2010): Information Technology Equipment, Immunity Characteristics, limits and methods of measurement
- European Council Directive 2004/108/EC
- EN 300-386 V1.6.1: 2012
- EN 55022:2006 Class B (ONUs)

### 3.2.2 Equipment safety standard compliance

The ONU equipment complies with the requirements of EN 60950-1, Safety of Information Technology Equipment for use in a restricted location (per R-269).

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### 3.2.3 Environmental standard compliance

The ONU equipment complies with the EN 300 019 European environmental standards.

### 3.2.4 Laser product standard compliance

For most ONUs, the ONU equipment complies with EN 60825-1 and IEC 60825-2 for laser products. If there is an exception to this compliance regulation, you can find this information in the standards compliance section of the unit data sheet in this Product Guide.

### 3.2.5 Resistibility requirements compliance

The ONU equipment complies with the requirements of ITU Recommendation K.21 for resistibility of telecommunication equipment installed in customer premises to over voltage and overcurrents.

### 3.2.6 Acoustic noise emission standard compliance

The ONU equipment complies with EN 300 753 acoustic noise emission limit and test methods.

## 3.3 Electrical safety guidelines

This section provides the electrical safety guidelines for the ONU equipment.



**Note 1** — The ONUs comply with the U.S. National Electrical Code. However, local electrical authorities have jurisdiction when there are differences between the local and U.S. standards.

**Note 2** — The ONUs comply with BS EN 61140.

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### 3.3.1 Power supplies

The use of any non-Nokia approved power supplies or power adapters is not supported or endorsed by Nokia. Such use will void any warranty or support contract with Nokia. Such use greatly increases the danger of damage to equipment or property.

### 3.3.2 Cabling

The following are the guidelines regarding cables used for the ONU equipment:

- All cables must be approved by the relevant national electrical code.
- The cables for outdoor installation of ONUs must be suitable for outdoor use.
- POTS wiring run outside the subscriber premises must comply with the requirements of local electrical codes. In some markets, the maximum allowed length of the outside run is 140 feet (43 m). If the outside run is longer, NEC requires primary protection at both the exit and entry points for the wire.

### 3.3.3 Protective earth

Earthing and bonding of the ONUs must comply with the requirements of local electrical codes.

## 3.4 ESD safety guidelines

The ONU equipment is sensitive to ESD. Operations personnel must observe the following ESD instructions when they handle the ONU equipment.



**Caution —** This equipment is ESD sensitive. Proper ESD protections should be used when you enter the TELCO Access portion of the ONU.

During installation and maintenance, service personnel must wear wrist straps to prevent damage caused by ESD.

## 3.5 Laser safety guidelines

Observe the following instructions when you perform installation, operations, and maintenance tasks on the ONU equipment.

Only qualified service personnel who are extremely familiar with laser radiation hazards should install or remove the fiber optic cables and units in this system.



**Danger** — There may be invisible laser radiation at the fiber optic cable when the cable is removed from the connector. Avoid direct exposure to the laser beam.

Observe the following danger for laser hazard. Eyes can be damaged when they are exposed to a laser beam. Take necessary precautions before you plug in the optical modules.



**Danger** — Possibility of equipment damage. Risk of eye damage by laser radiation.

### 3.5.1 Laser classification

The ONU is classified as a Class 1 laser product based on its transmit optical output.

#### 3.5.1.1 Laser warning labels

The following figures show the labels related to laser product, classification and warning.

Figure 5 shows a laser product label.

**Figure 5** Laser product label



18455

Figure 6 shows a laser classification label. Laser classification labels may be provided in other languages.

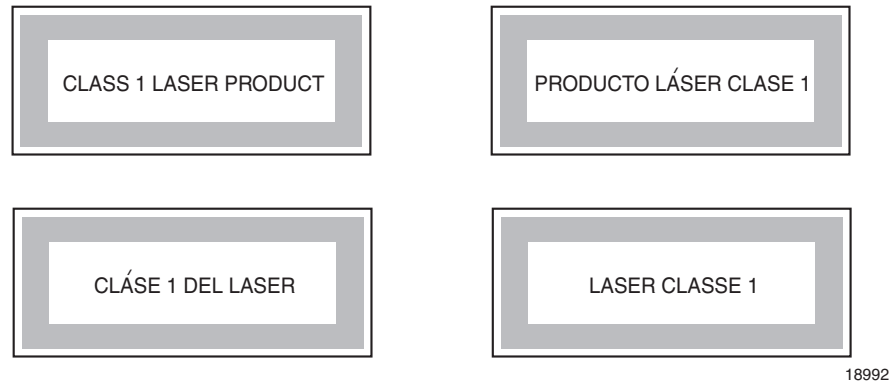
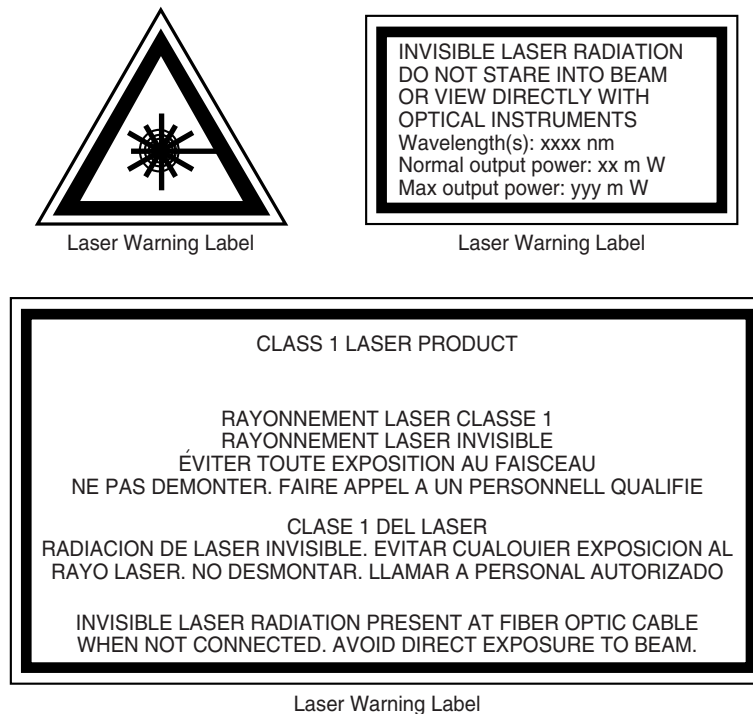
**Figure 6 Laser classification label**

Figure 7 shows a laser warning label and an explanatory label for laser products. Labels and warning may be provided in other languages. The explanatory label provides the following information:

- a warning that calls attention to the invisible laser radiation
- an instruction against staring into the beam or viewing directly with optical instruments
- wavelength
- normal output power
- maximum output power

**Figure 7 Laser warning labels**

18993

### 3.5.2 Transmit optical output

The maximum transmit optical output of an ONU is +5 dBm.

### 3.5.3 Normal laser operation

In normal operation, fiber cable laser radiation is always off until it receives signal from the line terminal card.

Eyes can be damaged when they are exposed to a laser beam. Operating personnel must observe the instructions on the laser explanatory label before plugging in the optical module.



**Danger** — Risk of eye damage by laser radiation.

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### 3.5.4 Location class

Use cable supports and guides to protect the receptacles from strain.

## 3.6 Environmental requirements

See the ONU technical specification documentation for more information about temperature ranges.

During operation in the supported temperature range, condensation inside the ONU caused by humidity is not an issue. To avoid condensation caused by rapid changes in temperature and humidity, Nokia recommends:

- The door of the ONU not be opened until temperature inside and outside the enclosure has stabilized.
- If the door of the ONU must be opened after a rapid change in temperature or humidity, use a dry cloth to wipe down the metal interior to prevent the risk of condensation.
- When high humidity is present, installation of a cover or tent over the ONU helps prevent condensation when the door is opened.





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## 4 ANSI ONU safety guidelines

This chapter provides information about the mandatory regulations that govern the installation and operation of the optical network terminals or units (ONTs or ONUs) in the North American or ANSI market.

### 4.1 Safety instructions

This section describes the safety instructions that are provided in the ONU customer documentation and on the equipment.

#### 4.1.1 Safety instruction boxes in customer documentation

The safety instruction boxes are provided in the ONU customer documentation. Observe the instructions to meet safety requirements.

The following is an example of the Danger box.



**Danger** — Possibility of personal injury.

The Danger box indicates that the described activity or situation may pose a threat to personal safety. It calls attention to a situation or procedure which, if not correctly performed or adhered to, may result in death or serious physical harm.

Do not proceed beyond a Danger box until the indicated conditions are fully understood and met.

The following is an example of the Warning box.



**Warning 1** — Possibility of equipment damage.

**Warning 2** — Possibility of data loss.

The Warning box indicates that the described activity or situation may, or will, cause equipment damage, loss of data, or serious performance problems. It identifies a possible equipment-damaging situation or provides essential information to avoid the degradation of system operations or data.

Do not proceed beyond a warning until the indicated conditions are fully understood and met.

The following is an example of the Caution box.



**Caution 1** — Possibility of service interruption.

**Caution 2** — Service interruption.

The Caution box indicates that the described activity or situation may, or will, cause service interruption.

Do not proceed beyond a caution until the indicated conditions are fully understood and met.

The following is an example of the Note box.



**Note** — Information of special interest.

The Note box provides information that assists the personnel working with ONUs. It does not provide safety-related instructions.

## 4.1.2 Safety-related labels

The ONU equipment is labeled with specific safety compliance information and instructions that are related to a variant of the ONU. Observe the instructions on the safety labels.

Table 2 provides examples of the text in the various ONU safety labels.

**Table 2**      **Safety labels**

Description	Label text
ESD warning	Caution: This assembly contains electrostatic sensitive device.
Laser classification	Class 1 laser product
Laser product compliance	This laser product conforms to all applicable standards of 21 CFR 1040.10 at date of manufacture.
FCC standards compliance	Tested to comply with FCC standards for home or office use.
CDRH compliance	Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007
Operation conditions	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.

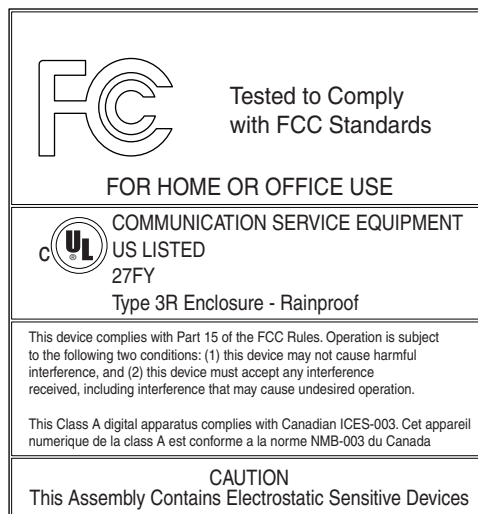
(1 of 2)

Description	Label text
Canadian standard compliance (modular ONU)	This Class A digital apparatus complies with Canadian ICES-003.
Canadian standard compliance (outdoor ONU)	This Class B digital apparatus complies with Canadian ICES-003.
CE marking	There are various CE symbols for CE compliance.
UL 60950-1	—

(2 of 2)

Figure 8 shows a sample safety label on the ONU equipment.

**Figure 8 Sample safety label on the ONU equipment**



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## 4.2 Safety standards compliance

This section describes the ONU compliance with North American safety standards.



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

## 4.2.1 EMC, EMI, and ESD standards compliance

The ONU equipment complies with the following requirements:

- Federal Communications Commission (FCC) CFR 47, Part 15, Subpart B, Class B requirements

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 needed.
- Consult the dealer or an experienced radio/TV technician for help.

## 4.2.2 CE standard compliance

The E-240G-B meets the CE safety standards. Figure 9 shows a sample safety compliance label, including the CE certification mark, on ONU equipment.

**Figure 9** Sample safety compliance label



### 4.2.3 Equipment safety standard compliance

The ONU equipment complies with the requirements of UL60950-1, Outdoor ONUs to “Communication Service Equipment” (CSE) and Indoor ONUs to Information Technology Equipment (ITE).

### 4.2.4 Laser product standards compliance

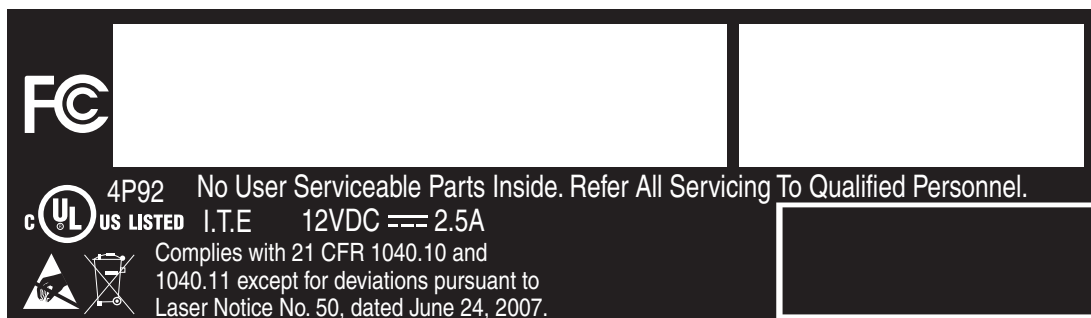
The ONU equipment complies with 21 CFR 1040.10 and CFR 1040.11, except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007 or to 21 CFR 1040.10 U.S. Center for Devices and Radiological Health (CDRH) of the Food and Drug Administration (FDA) Laser Notice 42 for ONUs containing Class 1 Laser modules certified by original manufactures.

Per CDRH 21 CFR 10.40.10 (h) (1) (iv) distributors of Class 1 laser products, such as Nokia ONUs shall leave the following Laser Safety cautions with the end user.

- a) “Class 1 Laser Product”
- b) “Caution – Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.”

Figure 10 shows a laser product label.

**Figure 10** Sample laser product label showing CDRH 21 CFR compliance



22813

### 4.2.5 Resistibility requirements compliance

The ONU equipment complies with the requirements of ITU Recommendation K.21 for resistibility of telecommunication equipment installed in customer premises to overvoltage and overcurrents.

## 4.3 Laser safety guidelines

Only qualified service personnel who are extremely familiar with laser radiation hazards should install or remove the fiber optic cables and units in this system.

Observe the following warnings when you perform installation, operations, and maintenance tasks on the ONU equipment.



**Danger** — There may be invisible laser radiation at the fiber optic cable when the cable is removed from the connector. Avoid direct exposure to beam.

Observe the following danger for a laser hazard. Eyes can be damaged when they are exposed to a laser beam. Take necessary precautions before you plug in the optical modules.



**Danger** — Possibility of equipment damage. Risk of eye damage by laser radiation.

Per CDRH 21 CFR 10.40.10 (h) (1) (iv) distributors of Class 1 laser products, such as Nokia ONUs shall leave the following Laser Safety cautions with the end user.

a) “Class 1 Laser Product”

b) “Caution – Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.”

### 4.3.1 Laser warning labels

The following figures show sample labels related to laser product, classification and warning.

Figure 11 shows a laser product label.

**Figure 11** Laser product label



18455

Figure 12 shows a laser classification label. Laser classification labels may be provided in other languages.

**Figure 12** Laser classification label

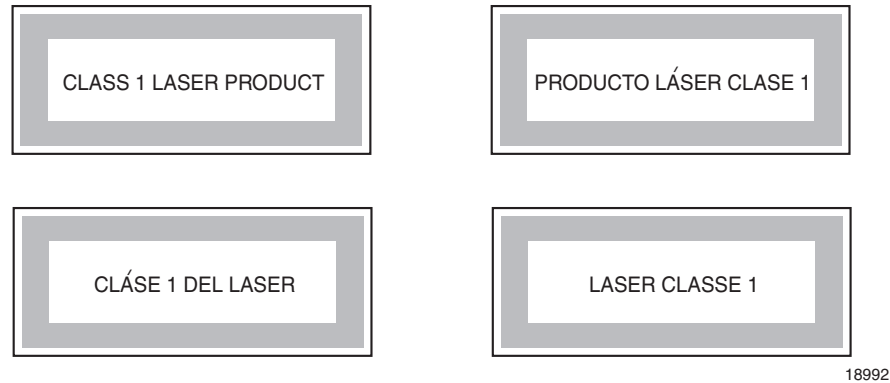


Figure 13 shows a laser warning label and an explanatory label for laser products. Explanatory labels may be provided in other languages. The explanatory label provides the following information:

- a warning that calls attention to the invisible laser radiation
- an instruction against staring into the beam or viewing directly with optical instruments
- wavelength
- normal output power
- maximum output power

**Figure 13** Laser warning labels

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### 4.3.2 Laser classification

The ONU is classified as a Class 1 laser product based on its transmit optical output.

For Class 1 laser products, lasers are safe under reasonably foreseeable conditions of operation, including the use of optical instruments for intrabeam viewing.

Figure 14 shows a sample laser product safety label on the ONU equipment.



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**Figure 14** Sample laser product safety label on the ONU equipment

### 4.3.3 Transmit optical output

The maximum transmit optical output of an ONU is +5 dBm.

### 4.3.4 Normal laser operation

In normal operation, fiber cable laser radiation is always off until it receives signal from the line terminal card.

Operating personnel must observe the instructions on the laser explanatory label before plugging in the optical module.



**Danger** — Risk of eye damage by laser radiation.

### 4.3.5 Location class

Use cable supports and guides to protect the receptacles from strain.

## 4.4 Electrical safety guidelines

This section provides the electrical safety guidelines for the ONU equipment.



**Note** — The ONUs comply with the U.S. National Electrical Code. However, local electrical authorities have jurisdiction when there are differences between the local and U.S. standards.

### 4.4.1 Power supplies

The use of any non-Nokia approved power supplies or power adapters is not supported or endorsed by Nokia. Such use will void any warranty or support contract with Nokia. Such use greatly increases the danger of damage to equipment or property.

### 4.4.2 Cabling

The following are the guidelines regarding cables used for the ONU equipment:

- Use only cables approved by the relevant national electrical code.
- Use cables suitable for outdoor use for outdoor installation of ONUs.
- The ONUs have been evaluated for use with external POTS wiring without primary protection that may not exceed 140 ft (43 m) in reach. However, the power cable must not exceed 100 ft (31 m).

### 4.4.3 Protective earth

Earthing and bonding of the ONUs must comply with the requirements of NEC article 250 or local electrical codes.

## 4.5 ESD safety guidelines

The ONU equipment is sensitive to ESD. Operations personnel must observe the following ESD instructions when they handle the ONU equipment.



**Caution** — This equipment is ESD sensitive. Proper ESD protections should be used when entering the TELCO Access portion of the ONU.

During installation and maintenance, service personnel must wear wrist straps to prevent damage caused by ESD.

Nokia recommends that you prepare the site before you install the ONU equipment. In addition, you must control relative humidity, use static dissipating material for furniture or flooring, and restrict the use of air conditioning.

## 4.6 Environmental requirements

See the ONU technical specification documentation for temperature ranges for ONUs.

During operation in the supported temperature range, condensation inside the ONU caused by humidity is not an issue. To avoid condensation caused by rapid changes in temperature and humidity, Nokia recommends:

- The door of the ONU not be opened until temperature inside and outside the enclosure has stabilized.
- If the door of the ONU must be opened after a rapid change in temperature or humidity, use a dry cloth to wipe down the metal interior to prevent the risk of condensation.
- When high humidity is present, installation of a cover or tent over the ONU helps prevent condensation when the door is opened.



# 5 E-240G-B unit data sheet

- 5.1 E-240G-B part numbers and identification
- 5.2 E-240G-B general description
- 5.4 Turbo mode
- 5.5 E-240G-B software and installation feature support
- 5.6 E-240G-B interfaces and interface capacity
- 5.7 E-240G-B LEDs
- 5.8 E-240G-B detailed specifications
- 5.9 E-240G-B functional blocks
- 5.10 E-240G-B standards compliance
- 5.11 E-240G-B special considerations

## 5.1 E-240G-B part numbers and identification

Table 3 provides identification information about E-240G-B ONUs.

Table 3 E-240G-B part numbers and identification

Mnemonic	Ordering kit part number	Provisioning number	Description	CLEI	CPR	ECI/ Bar code
E-240G-B	3FE 46260 AA	3FE 46261 AA	Turbo EPON temperature hardened G-series ONU, version A, 2 POTS and 4 Gigabit Ethernet interfaces. Kit includes 3-pin US plug AC/DC power adapter with AC cable	—	—	—
	3FE 46261 AA		Turbo EPON temperature hardened G-series ONU, version A, 2 POTS and 4 Gigabit Ethernet interfaces. Includes ONU only.			

Table 4 provides power supply ordering information about E-240G-B ONUs. For more information on power supplies, see the *7368 ISAM ONT Power Supply and UPS Guide*.

**Table 4 E-240G-B power supply**

Power/UPS model	Power UPS and cabling part number information	Customer category or country compliance tested for <sup>(1)</sup>	Notes
E-240G-B flat or wall-mounted			
3-pin US plug AC/DC adapter	<ul style="list-style-type: none"> <li>1AF01226ASAA</li> <li>1AF01226ASAB (Level 6 energy efficient rated adapter, required for the United States)</li> </ul>	ANSI municipality United States, Canada	Provided with the 3FE 46260 AA orderable kit
CyberPower CyberShield CSN27U12VUPS	<p>(1) 12V/24W UPS part number: 3EM24509AA</p> <p>(2) DC Power Cord:</p> <ul style="list-style-type: none"> <li>8ft: 3EM24378AA</li> <li>25ft: 3EM24378AB</li> </ul> <p>(3) AC power cord, 1AB38334xxxx:</p> <ul style="list-style-type: none"> <li>0007: Australia/NZ</li> <li>0008: Europe (ETSI)</li> <li>0009: UK/Ireland</li> <li>0010: ANSI</li> </ul>	ANSI municipality United States, Canada  Common European Union countries (ETSI)	CyberPower UPS battery not included. Compliant battery is BB battery BP7.2-12
Delta DUPS-1232 G UPS	<p>(1) 12V/32W UPS part number: 3EM24377AA</p> <p>(2) DC power cord:</p> <ul style="list-style-type: none"> <li>8ft: 3EM24378AA</li> <li>25ft: 3EM24378AB</li> </ul> <p>(3) AC power cord: US variant included</p>	ANSI municipality United States, Canada	<p>Battery not included with UPS. Compliant battery models:</p> <ul style="list-style-type: none"> <li>BB Battery BP7.2-12</li> <li>Vision CP1270A</li> <li>CSB GP1272</li> <li>GS Battery PE12V7.2 (ANSI GS Battery Nokia part number 1AF17581AC)</li> <li>Ritar RT1270</li> </ul> <p>Ferrites are not required.</p>
Delta DUPS-1232 GA UPS	<p>(1) 12V/32W UPS part number: 3EM24559AA</p> <p>(2) DC power cord:</p> <ul style="list-style-type: none"> <li>8ft: 3EM24378AA</li> <li>25ft: 3EM24378AB</li> </ul> <p>(3) AC power cord: US variant included</p>	ANSI municipality United States, Canada	<p>Battery not included with UPS. Compliant battery models:</p> <ul style="list-style-type: none"> <li>BB Battery BP7.2-12</li> <li>Vision CP1270A</li> <li>CSB GP1272</li> <li>GS Battery PE12V7.2 (ANSI GS Battery Nokia part number 1AF17581AC)</li> <li>Ritar RT1270</li> </ul> <p>Ferrites are not required.</p>

(1 of 2)

Power/UPS model	Power UPS and cabling part number information	Customer category or country compliance tested for <sup>(1)</sup>	Notes
Artesyn (formerly Emerson) 24W AC/DC switching power adapter with Molex DC power cable	(1) Part number: <ul style="list-style-type: none"> <li>1AF01226ASAB</li> <li>1AF01226ASAA</li> </ul> (2) AC power cord, 1AB07676xxxx: <ul style="list-style-type: none"> <li>0010 - UK/Ireland/Middle East</li> <li>0071 - Europe</li> <li>0009 - AUS/NZ/China</li> <li>0072 - UK/S.Africa/Middle East</li> <li>0073 - ANSI</li> </ul>	ANSI municipality United States, Canada  Common European Union countries	Artesyn 12V/24W AC/DC power brick, 3-pin IEC320 AC input receptacle, Molex DC connector.
E-240G-B in outdoor enclosure			
Delta DUPS-1232 A UPS	(1) 12V/24W UPS order number: 3EM23134AB (2) AC power cord, 1AB38334xxxx: <ul style="list-style-type: none"> <li>0007 - Australia/NZ</li> <li>0008 - Europe</li> <li>0009 - UK/Ireland</li> <li>0010 - ANSI</li> </ul> (3) ONU to UPS cable = 3EM18276AD (4) 7.2Ahr Battery = 1AF17581ACAA	ANSI municipality United States/Canada	Battery not included with UPS. Compliant battery models: <ul style="list-style-type: none"> <li>BB Battery BP7.2-12</li> <li>GS Battery PE12V7.2 (ANSI GS Battery Nokia part number 1AF17581AC)</li> </ul>

(2 of 2)

**Note**

- <sup>(1)</sup> The list of detailed tests (for example, GR-1089i3 (ESD, EFT, RDE, CDE, RDI, and CDI), GR-1089i4 (LightningAC) and marks (for example, FCC Class B, UL, CE Mark Class B, and K.21) are available from your Nokia technical support representative.

Table 5 provides accessory ordering information about E-240G-B ONUs.

**Table 5 E-240G-B accessories**

Accessory	Orderable part number	Notes
Fiber tray	3EM 23509 AA	For indoor wall mounting

## 5.2 E-240G-B general description

E-240G-B ONUs provide a subscriber interface for the system. The ONU terminates the PON interface and converts it to user interfaces that directly connect to subscriber devices. The ONU is compatible with all existing subscriber equipment, including analog phones with both tone and rotary dial capabilities, cordless phones, modems, fax machines, and caller ID boxes (Type I, Type II, and Type III).

The E-240G-B ONUs are temperature hardened and can be installed:

- horizontally on a flat surface
- vertically attached to a wall
- in an outdoor enclosure

This ONU provides the following functions:

- network demarcation for all services
- 2 Gb/s downstream Turbo mode; see Section 5.4 for details
- DPoE multicast 2.0 message support
- 256 RAM and 256 Flash
- voice interworking function from the analog POTS lines to the VoIP/Ethernet layers
- interworking functions between LLIDs and Ethernet layers
- mux and demux functions to the PON
- optical to electrical conversion
- optics that support received signal strength indication (RSSI)
- fiber tray for wall mounting
- on/off button
- Ethernet and POTS ports have Type 4 lightning protection

## 5.3 Optical parameters

The upstream wavelength operation for the E-240G-B ONU is as follows:

- minimum: 1290 nm
- typical: 1310 nm
- maximum: 1330 nm

For more details about the optical parameters, see the section “ONT optical budget” in the *Product Overview* guide.

## 5.4 Turbo mode

The E-240G-B supports Turbo mode.

The 1490nm wavelength operation is run at 2.5 Gb/s downstream to allow greater bandwidth on the PON in the downstream direction. Note that although the line rate is 2.5 Gb/s, the downstream bandwidth available is 2 Gb/s.

The upstream wavelength remains at 1.25 Gb/s.

For more details about the optical parameters, see the section “ONT optical budget” in the *Product Overview* guide.



## 5.5 E-240G-B software and installation feature support

For information about installing or replacing the E-240G-B see:

- [Install an E-240G-B ONU](#)
- [Replace an E-240G-B ONU](#)

For information about the following topics, see the *7368 ISAM ONT Product Overview Guide*:

- ONT and MDU general descriptions of features and functions
- Ethernet interface specifications
- POTS interface specifications
- RSSI specifications
- ONT optical budget
- ONT management using an ONT interface

## 5.6 E-240G-B interfaces and interface capacity

Table 6 describes the supported interfaces for E-240G-B ONUs.

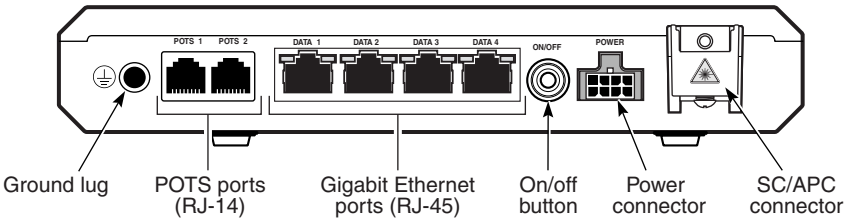
**Table 6 E-240G-B ONU interfaces**

ONU category description	Interface capacity				
	POTS ports	Ethernet ports	VDSL2 interfaces	MoCA interface	RF Video interface
Single-residence Gigabit Ethernet ONUs with POTS and without RF video	2	4	0	0	0

### 5.6.1 E-240G-B connections and components

Figures 15 shows the E-240G-B ONU physical connections.

Figure 15 E-240G-B ONU connections



24108

Table 7 describes the E-240G-B ONU physical connections.

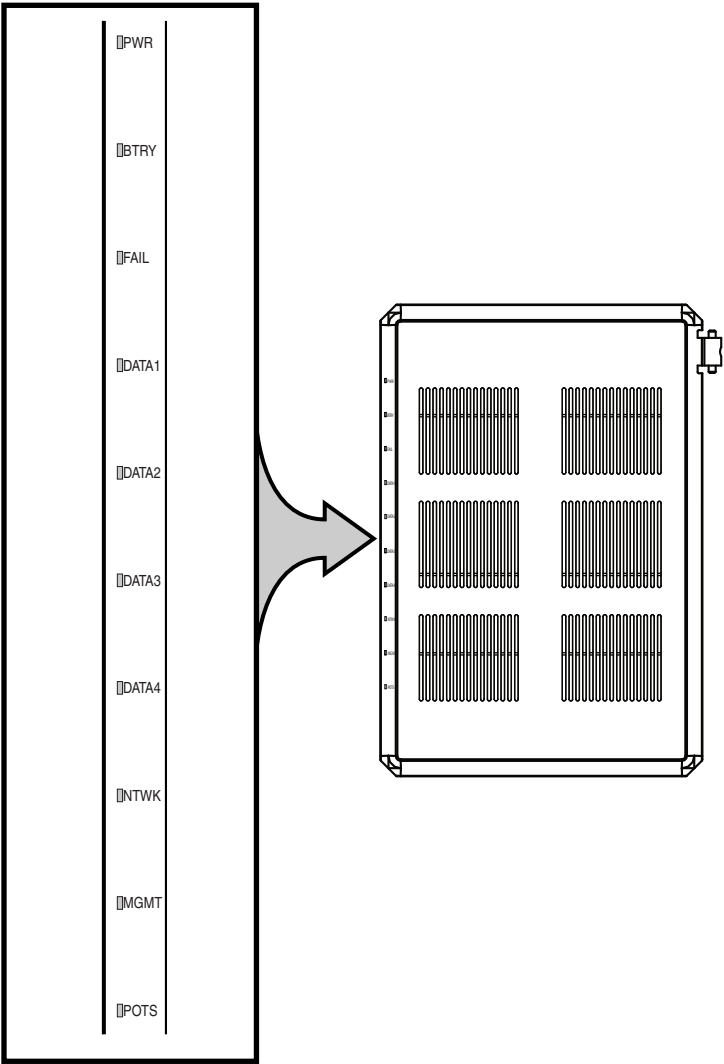
Table 7 E-240G-B ONU physical connections

Connection	Description
POTS	This connection is provided through RJ-14 ports.
Ethernet ports	This connection is provided through Ethernet RJ-45 cables. Four Ethernet connections are supported. The Ethernet ports can support both data and in-band video services on all four interfaces.
Power	This connection is provided through a power cable with a Molex connector to the power connector.
Fiber optic	This connection is provided through a SC/APC fiber optic cable and connector.

## 5.7 E-240G-B LEDs

Figure 16 shows the E-240G-B ONU LEDs.

Figure 16 E-240G-B ONU LEDs



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Table 8 lists and describes the E-240G-B ONU LEDs.

Table 8 E-240G-B ONU LEDs descriptions

Indicator	LED color and behavior	LED behavior description
PWR	Off Green	No power Operating on ac power

(1 of 2)

Indicator	LED color and behavior	LED behavior description
BTRY	Off	Battery alarm set or battery not provisioned (not affected by AC power failure)
	Green	Battery charged; no battery alarms
FAIL	Off	ONU is operating without failure
	Red	ONU operation failure (not ranged)
DATA 1 to 4	Off	Not provisioned or no Ethernet connection
	Green	Link detected/operational
NTWK	Off	1490 nm data path is not available
	Green solid	1490 nm data path is available/operational
MGMT	Green solid	Full communication, ranging, sync between OLT/ONU
	Green flashing	Software download
	Off	ONU is offline
POTS	Off	No POTS provisioned (all phones are on-hook or no phones connected)
	Green solid	One or more phones is off-hook

(2 of 2)

## 5.8 E-240G-B detailed specifications

Table 9 lists the physical specifications for E-240G-B ONUs.

**Table 9 E-240G-B ONU physical specifications**

Dimensions	Specifications
Length	8.2 in. (20.8 cm)
Width	5.6 in. (14.2 cm)
Height without fiber tray	1.3 in. (3.3 cm)
Height with fiber tray	1.9 in. (4.9 cm)
<b>E-240G-B ONU when installed inside an outdoor enclosure</b>	
Height	13.5 in. (34.3 cm)
Width	12 in. (30.5 cm)
Depth	4.3 in. (10.9 cm)
<b>E-240G-B ONU</b>	
Weight without fiber tray [within $\pm 0.5$ lb (0.23 kg)]	0.57 lb (0.26 kg)
Weight with fiber tray [within $\pm 0.5$ lb (0.23 kg)]	0.71 lb (0.32 kg)

Table 10 lists power consumption specifications for E-240G-B ONUs.

Table 10 E-240G-B ONU power consumption specifications

Mnemonic	Maximum power (not to exceed)	Condition	Minimum power	Condition
E-240G-B	7 W	2 POTS off-hook, 4 Gig-E operational	4.5 W	2 POTS on-hook, other interfaces/services not provisioned

Table 11 lists the environmental requirements for E-240G-B ONUs.

Table 11 E-240G-B ONU environmental requirements

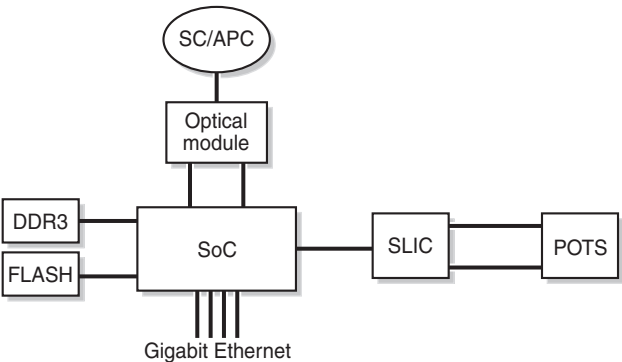
ONU type		
Mounting method	Temperature range and humidity	Altitude
Desk or wall mounted or mounted in an outdoor enclosure	Operating: -40°F to 140°F (-40°C to 60°C) ambient temperature 5% to 85% relative humidity, non-condensing	Maximum operating altitude is 10 000 ft (3048 m) above mean sea level
	Storage: -40°F to 140°F (-40° to 60°C) 5% to 93% relative humidity, non-condensing	Maximum non-operating altitude is 40 000 ft (12 192 m) above mean sea level

5.9 E-240G-B functional blocks

These ONUs transmit Ethernet packets to four RJ-45 Ethernet ports, and voice traffic to two RJ-14 POTS ports. These ONUs also feature fiber optic and power connectors.

Figure 17 shows the functional blocks for an ONU with Gigabit Ethernet and POTS.

Figure 17 Single-residence Gigabit Ethernet ONU with POTS



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## 5.10 E-240G-B standards compliance

E-240G-B ONUs are compliant with the following standards:

- 802.1p mapper service profile on the upstream

### 5.10.1 Energy-related products standby and off modes compliance

Hereby, Nokia declares that the E-240G-B ONUs are in compliance with the essential requirements and other relevant provisions of Directive 2009/125/EC together with Commission Regulation (EC) No 1275/2008 and Commission Regulation (EC) No 801/2013.

The E-240G-B ONUs qualify as high network availability (HiNA) equipment. Since the main purpose of E-240G-B ONUs is to provide network functionality with HiNA 7 days /24 hours, the modes Off/Standby, Power Management, and Networked Standby are inappropriate.

For information about the type and number of network ports, see [“E-240G-B interfaces and interface capacity”](#) in this chapter.

For information about power consumption, see [“E-240G-B detailed specifications”](#) in this chapter.

### 5.10.2 CE standards compliance

The E-240G-B meets the CE safety standards. Figure 18 shows a sample safety compliance label, including the CE certification mark, on ONU equipment.

### 5.10.3 Laser product standards compliance

Figure 18 shows the laser product label. For more information on laser product standards compliance, see [Laser safety guidelines](#).

**Figure 18** Laser product label showing safety standard compliance



### 5.10.4 FCC compliance statement

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.
- 2 This device must accept any interference received, including interference that may cause undesired operation.

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

NOTE: 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 needed.
- Consult the dealer or an experienced radio/TV technician for help.

### 5.10.5 Responsible party

Table 12 lists the party in the US responsible for this ONU.

**Table 12 Responsible party contact information**

Legal Company name	Nokia USA Inc.
Address	2301 SUGAR BUSH RD. STE 300, RALEIGH, NC 27612
Phone, Fax	+1 919 850 6127

## 5.11 E-240G-B special considerations

None.





## 6 Install an E-240G-B ONU

### 6.1 Purpose

### 6.2 General

### 6.3 Prerequisites

### 6.4 Recommended tools

### 6.5 Safety information

### 6.6 ONU installation procedure

### 6.7 ONU mounting in an MNTS-A shelf

## 6.1 Purpose

This chapter provides the steps to install an E-240G-B ONU.

## 6.2 General

The procedure listed in this chapter describes mounting and cabling for the E-240G-B ONUs.

For more information about installing EPON ONUs, see the Operations and Commands manuals for your OLT.

## 6.3 Prerequisites

The prerequisites are:

- The ONU software version must be in the NT file system.
- All required cables must be present.

## 6.4 Recommended tools

You need the following tools for the installation:

- #2 Phillips screwdriver
- 1/4 in. (6 mm) flat blade screwdriver

- wire strippers
- fiber optic splicing tools
- RJ-45 cable plug crimp tool
- voltmeter or multimeter
- optical power meter
- drill and drill bits
- pin-in-hex screwdriver

## 6.5 Safety information

Read the following safety information before installing the ONU.



**Danger 1** — Hazardous electrical voltages and currents can cause serious physical harm or death. Always use insulated tools and follow proper safety precautions when connecting or disconnecting power circuits.

**Danger 2** — Make sure all sources of power are turned off and have no live voltages present on feed lines or terminals. Use a voltmeter to measure for voltage before proceeding.

**Danger 3** — Always contact the local utility company before connecting the enclosure to the utilities.



**Warning** — This equipment is ESD sensitive. Proper ESD protections should be used when removing the fiber access cover of the ONU.



**Caution** — Keep indoor ONUs out of direct sunlight. Prolonged exposure to direct sunlight can damage the ONU.



**Note 1** — Observe the local and national laws and regulations that may be applicable to this installation.

**Note 2** — The ONU should be installed in accordance with the applicable requirements of the NEC or CEC. Local authorities and practices take precedent when there is conflict between the local standard and the NEC or CEC.

**Note 3** — The ONU must be installed by qualified service personnel.

**Note 4** — Indoor ONUs must be installed with cables that are suitably rated and listed for indoor use.

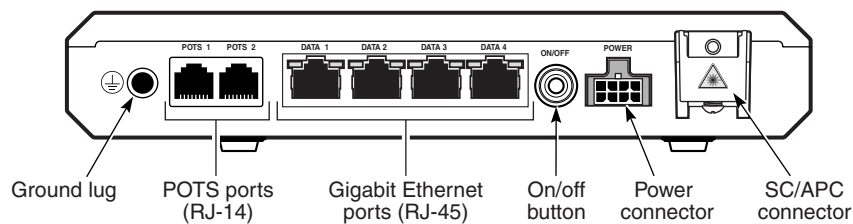
**Note 5** — See [E-240G-B detailed specifications](#) in the [E-240G-B unit data sheet](#) for the temperature ranges for ONUs.

## 6.6 ONU installation procedure

Use this procedure to install an E-240G-B ONU.

- 1 Place the ONU:
  - a On a flat surface, go to step 2.
  - b On a wall, go to step 3.
  - c In an outdoor enclosure, go to step 4.
- 2 Place the ONU on the flat surface, such as a desk, horizontally resting on its four feet as shown in Figure 19; go to step 7.

**Figure 19** E-240G-B ONU on a desk



24108

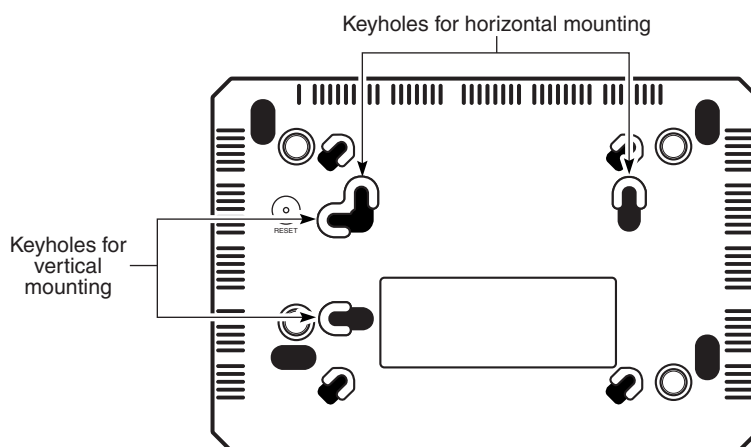
- 
- 3 Mount the ONU as shown in Figure 20. If possible, mount the ONU on a wall stud.



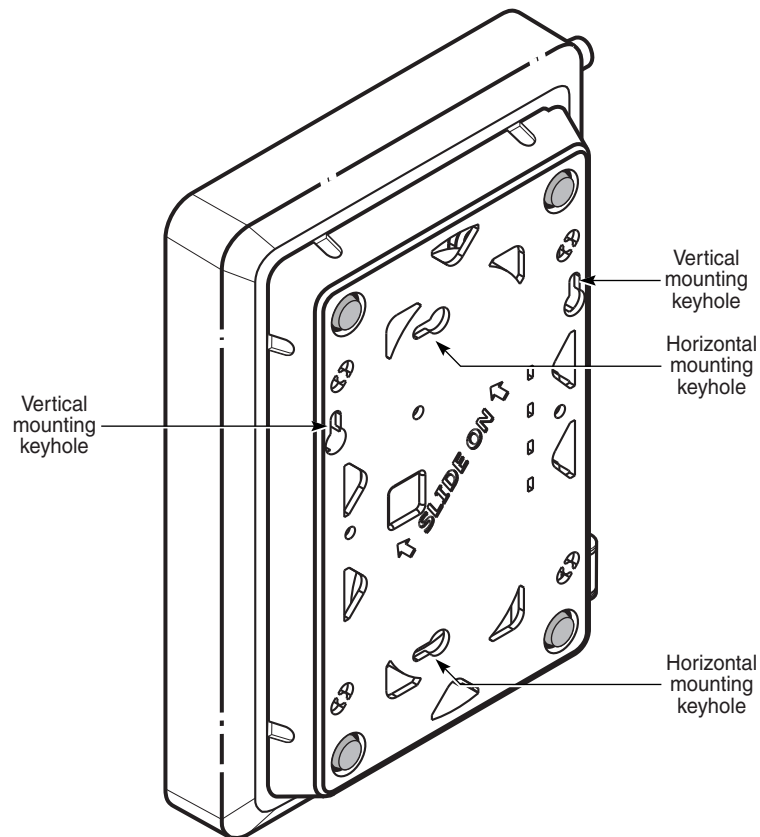
**Note** — If the Emerson 24W AC/DC Power Adapter, CyberPower CS27 UPS, or Delta DUPS-1232GA will be used, the ONU must be mounted a minimum of 31.5 in (0.8 m) above the floor.

If the Delta DUPS-1232A will be used, the ONU must be mounted a minimum of 59 in (1.5 m) above the floor.

**Figure 20** Wall mounting keyholes on E-240G-B ONUs (without fiber storage tray)



24111

**Figure 21** Wall mounting keyholes on the fiber storage tray

20445

- i Mark the wall with the location of the mounting holes. These holes should be the same distance apart as the distance between the centers of the keyholes on the ONU or the fiber storage tray. Use the ONU or the fiber storage tray as a wall mounting template to indicate the location of the mounting holes on the wall.
- ii Wrap the excess fiber optic cable counterclockwise around the cable spools molded into the fiber storage tray.  
  
Use the cable clips provided with the fiber storage tray to secure the fiber optic cable in the tray.  
  
Ensure there is enough spare cable for the SC/APC connector to reach the fiber optic connector on the back panel of the ONU.
- iii Lower the E-240G-B ONU onto the fiber storage tray ensuring that the SC/APC connector on the ONU feeds into the cable notch in the fiber storage tray.

- 
- iv Thread the end of fiber optic cable with the SC/APC adapter into a cable notch molded into the fiber storage tray.
  - v Go to step [7](#).

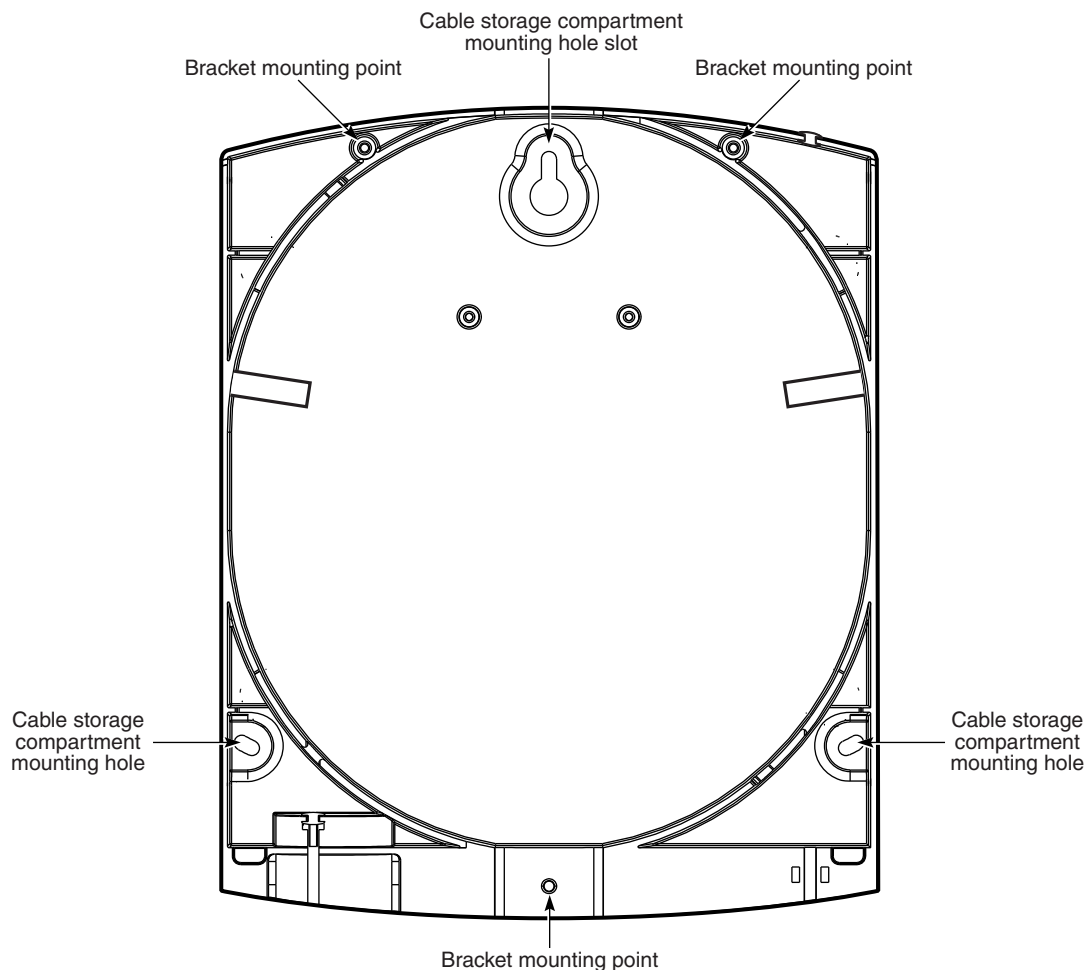
---

**4** Wall-mount the outdoor enclosure.

**Note** — The outdoor enclosure must be mounted a minimum of 59 in. (1.5 m) above the floor.

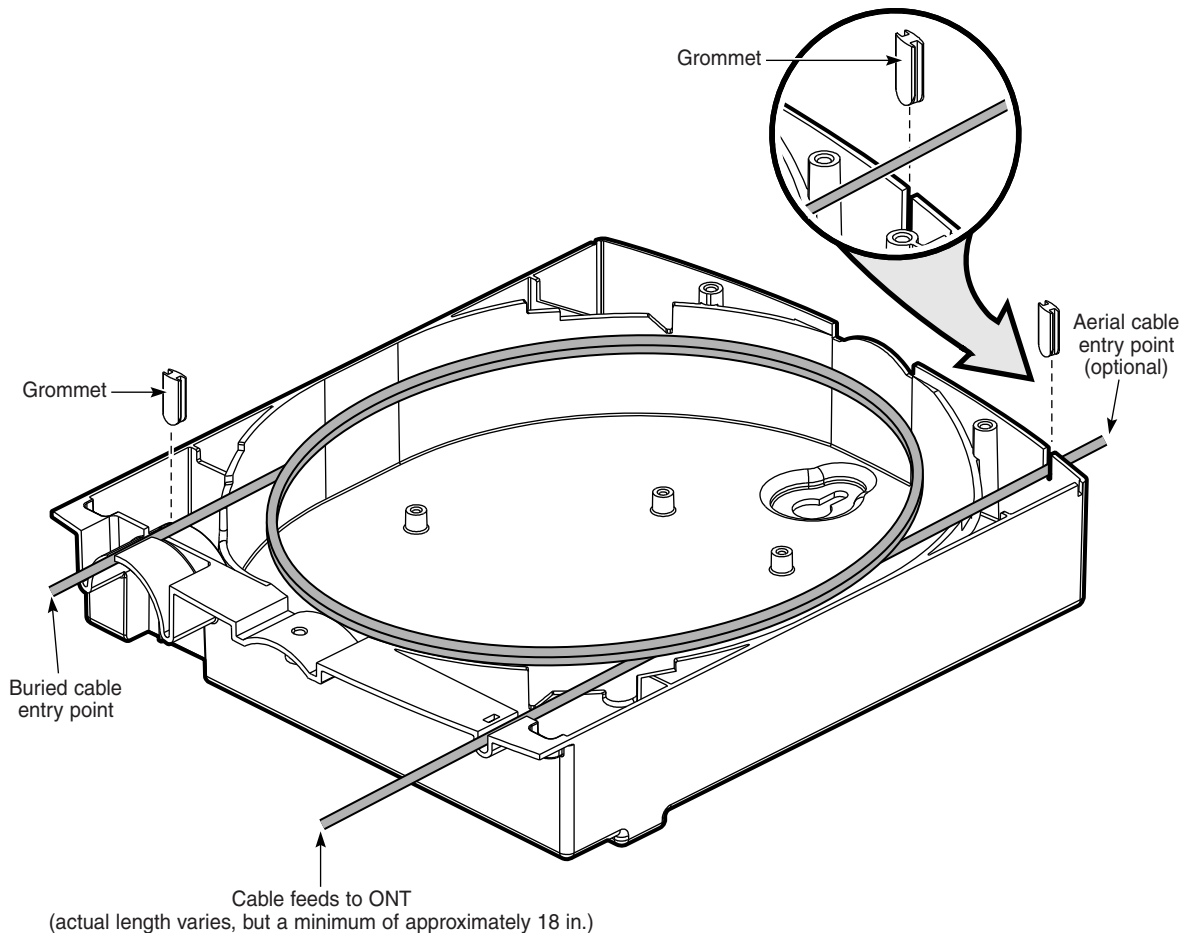
- a** If you are using a fiber-slack storage tray (FSST):
  - i** Secure the FSST to the mounting area. Use the appropriate hardware as defined by local installation practices. Use the cable storage compartment mounting holes; see Figure 22.

**Figure 22** Mounting the cable storage compartment (3EM 20293 AA)



19090

- ii** Remove either the aerial or buried cable entry grommet; see Figure 23.

**Figure 23** Coiled cable routing (open view)

18812

- iii Cut the width of the cable off of the end of the grommet.
- iv Reinstall the grommet into the slot over the cable.
- v Coil the excess cable in a clockwise direction, allowing enough cable to exit the lower right cable exit port; see Figure 23.



**Note 1** — There must be adequate length for the fiber optic cable to curve around and maintain minimum bend radius, enter into the ONU enclosure and make the optical connection.

**Note 2** — There must be approximately 20 in. (50 cm) of cable exiting the FSST at the right cable exit point.

**Note 3** — The FSST stores a maximum of 75 ft (22.86 m) of cable.

- vi Secure the fiber optic cable with the coil retention clamp; see Figure 23.



- vii Bolt the outdoor enclosure to the four mounting points on the cable storage compartment using the supplied #8-16 X 1/2 self tapping screws; see Figure 22 and 24.

- viii Go to step 6.

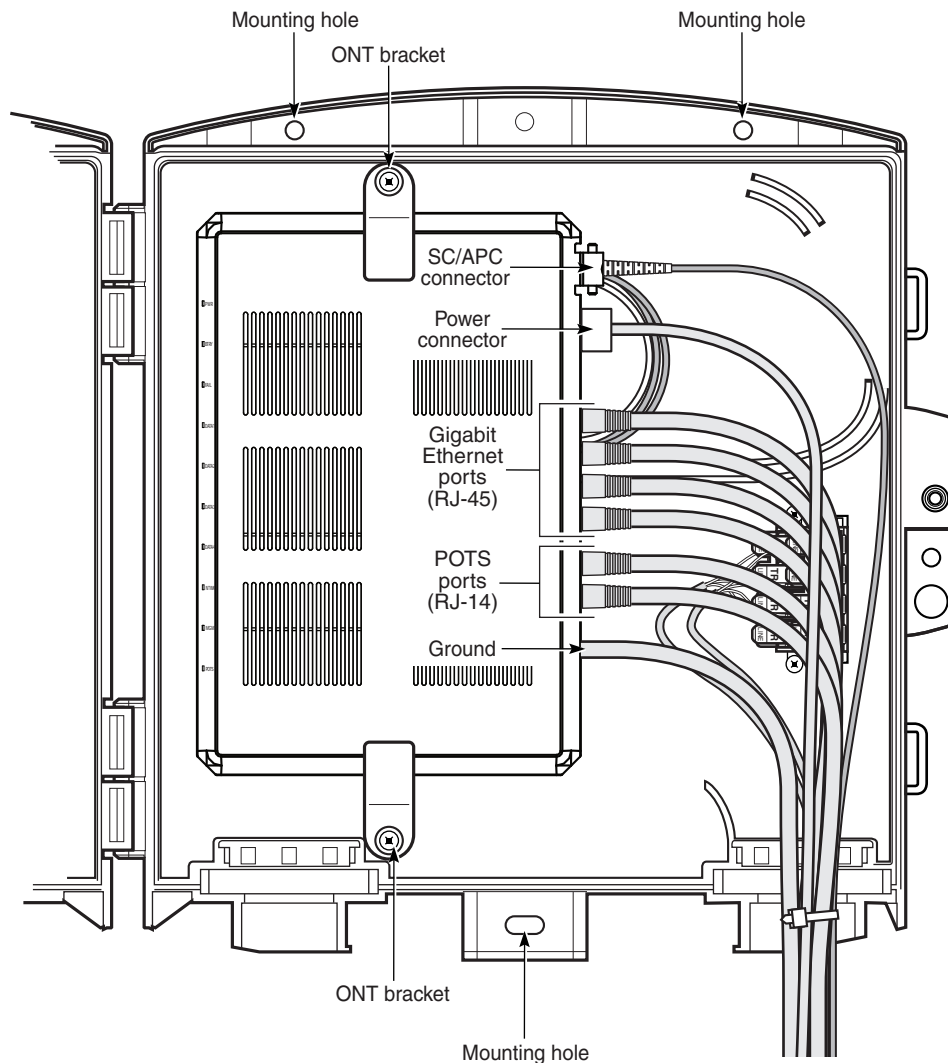
**b** If you are not using an FSST:

- i Open the access cover on the outdoor enclosure by loosening the pin-in-hex screw.



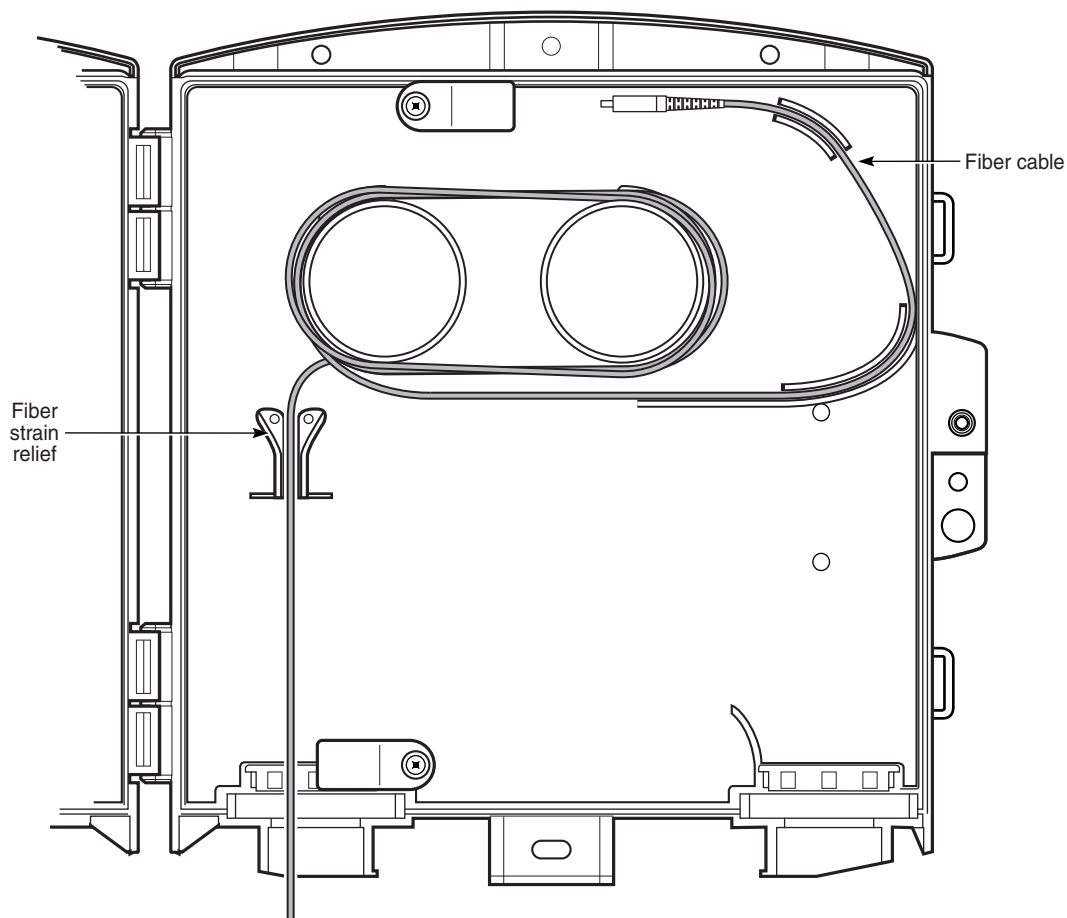
**Note —** The access cover of the outdoor enclosure must be open to access the three mounting holes used to secure the outdoor enclosure to the wall.

- ii Secure the outdoor enclosure to the mounting area at the subscriber premises. Use the appropriate hardware as defined by local installation practices. Mount the outdoor enclosure using the specified mounting holes as shown in Figure 24.

**Figure 24** Mounting the outdoor enclosure for the E-240G-B ONU

24110

- 5 Place the fiber optic cable inside the wall-mounted outdoor enclosure as shown in Figure 25. Tie wrap the cable at the fiber optic strain relief if necessary.

**Figure 25** Outdoor enclosure with fiber optic cable

23703

- 6 Secure the E-240G-B ONU in the wall-mounted outdoor enclosure.
  - a Turn the brackets to the open position and position the E-240G-B ONU within the outdoor enclosure and between the ONU brackets, as shown in Figure 24.
  - b Secure the E-240G-B ONU within the ONU brackets by turning the brackets to the closed position.



**Warning** — Do not overtighten the ONU bracket when securing the E-240G-B ONU to the outdoor enclosure. The ONU can become skewed and compromise the environmental seal of the ONU mounted in the outdoor enclosure.

- 7 Review the connection locations shown in Figure 19 for E-240G-B ONUs.

---

**8** To ground an E-240G-B ONU:

**Danger 1** — Hazardous electrical voltages and currents can cause serious physical harm or death. Always use insulated tools and follow proper safety precautions when connecting or disconnecting power circuits. For more information on grounding safety, see the Appendix - [Grounding safety](#).

**Danger 2** — Make sure all sources of power are turned off and have no live voltages present on feed lines or terminals. Use a voltmeter to measure for voltage before proceeding.

**Danger 3** — Always contact the local utility company before connecting the enclosure to the utilities.

- a** An indoor desktop or wall-mounted E-240G-B ONU is grounded by the 3-pin power adapter or a grounded UPS.



**Warning** — Do not connect the ground lug of the E-240G-B ONU for indoor installations; the ONU is grounded by the power adapter or UPS.

- b** An E-240G-B ONU mounted in an outdoor enclosure must be grounded with a permanent ground wire.

Connect a single #6 to #14 AWG ground wire to the recessed ground lug on the E-240G-B ONU; see Figure 24. The ground wire exits from the back of the ONU in the same way as the cables.

---

**9** Route up to four Ethernet cables to the RJ-45 ports, as shown in Figures 19 and Figure 24. Connect the Ethernet cables.

---

**10** Route up to two POTS cables to the RJ-14 ports, as shown in Figure 19 and Figure 24. Connect the POTS cables.

- 11** Connect the fiber optic cable to an E-240G-B ONU.



**Danger** — Fiber cables transmit invisible laser light. To avoid eye damage or blindness, never look directly into fibers, connectors, or adapters.



**Warning** — Be careful to maintain a bend radius of no less than 1.5 inches (3.8 cm) when connecting the fiber optic cable. Too small of a bend radius in the cable can result in damage to the optic fiber.

- i Route the fiber optic cable to the ONU.
- ii Loosen the lock screw on the fiber optic connection clip.
- iii Lift the connection clip up.
- iv Plug the fiber optic cable with SC/APC adapter into the fiber optic connector located on the back of the E-240G-B, as show in Figures 19 and 24.
- v Lower the clip so that it secures the fiber optic cable.
- vi Tighten the lock screw.

- 
- 12** Install the power supply according to manufacturer specifications.



**Caution** — ONUs must be powered by a Listed or CE approved and marked limited power source power supply with a minimum output rate of 12 V dc, 1.25 A.

- 
- 13** Connect the power cable to the ONU.

- 
- 14** Power up the ONU by using the ON/OFF power switch.

- 
- 15** For information on downloading, activating, and committing ONU software for an E-240G-B ONU, see the Operations and Commands manuals for your OLT.

- 
- 16** Activate and test the services; see the *7368 Hardware and Cabling Installation Guide*.

- 
- 17** For an E-240G-B ONU installed in an outdoor enclosure, close the access cover of the outdoor enclosure and secure using the pin-in-hex screw.

- 
- 18** STOP. This procedure is complete.

---

## 6.7 ONU mounting in an MNTS-A shelf

Up to eight E-240G-B ONUs can be mounted in an MNTS-A (Multiple Network Terminal Shelf) indoor shelf.

The part number for the MNTS-A shelf kit is 3FE 45042 AA. The kit includes the shelf and cable assembly. The ONUs must be purchased separately.

The shelf can be mounted into a 19-inch rack or to a wall, and can hold any combination of E-240G-A, E-240G-B, G-240G-A, and G-440G-A ONUs/ONTs.

Table [13](#) lists the dimensions for the MNTS-A shelf.

**Table 13** MNTS-A shelf physical specifications

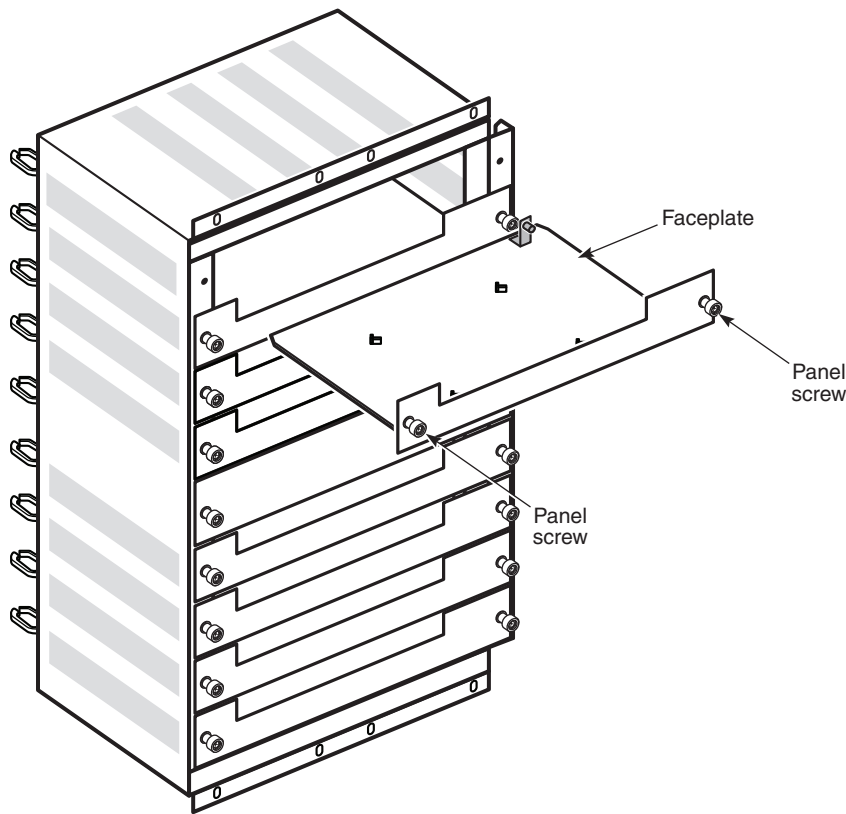
Dimensions	Specifications
Length	17.8 in. (45.1 cm)
Height	11 in. (27.9 cm)
Width	6.7 in. (17.1 cm)



**Warning** — Make sure there is enough clearance above and below the shelf to allow air to circulate, and allow at least 15 cm at the rear for cabling.

- 1 Place the MNTS-A shelf on a stable surface, loosen the two panel screws, and pull out the faceplate. See Figure 26 for the location of the faceplate and panel screws.

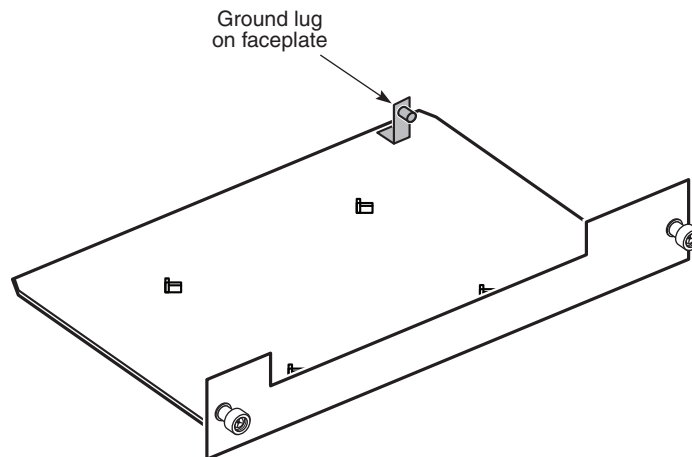
**Figure 26** Faceplate and panel screws



24724

- 
- 2 Remove the ground lug from the faceplate. See Figure 27.

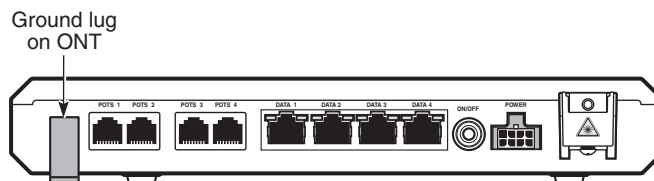
**Figure 27** Ground lug on the faceplate



24725

- 
- 3 Install the ground lug you just removed from the faceplate in the recessed ground lug on the ONU and tighten it. See Figure 28.

**Figure 28** Ground lug on the ONU (G-240G-A shown)

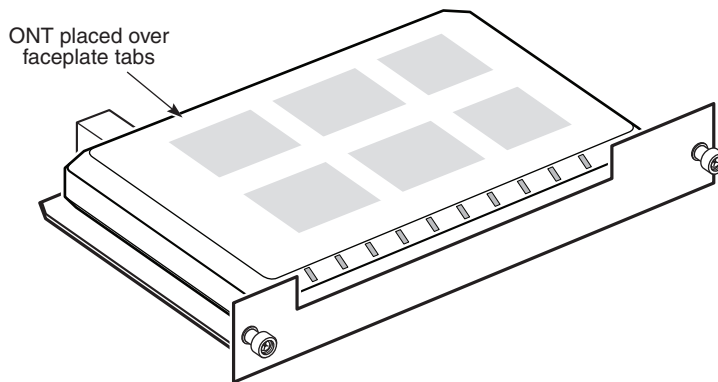


24726



- 4 Mount the ONU to the faceplate:
  - a Place the ONU on the faceplate, making sure that the 4 tabs on the bottom of the faceplate are inserted into the ONU. See Figure 29.

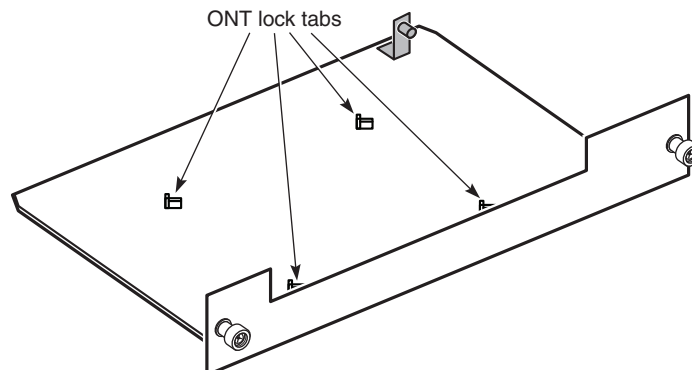
**Figure 29 Faceplate tabs**



24727

- b Slide the ONU to the appropriate position.
  - c Make sure all tabs are locked. See Figure 30.

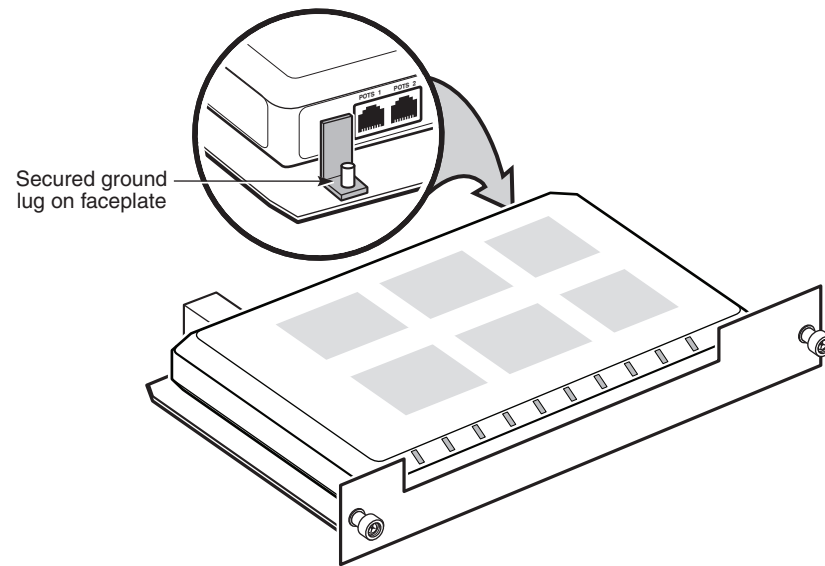
**Figure 30 Lock tabs on the ONU**



24728

- d Tighten the ground lug on the faceplate with an M5 screw. See Figure 31.

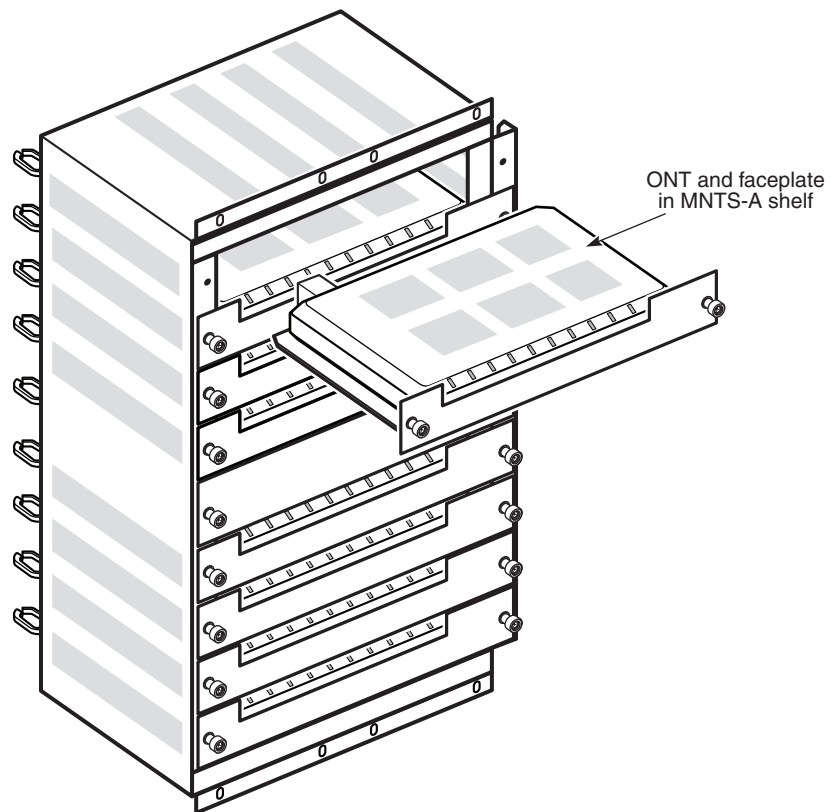
**Figure 31** Secured ground lug on the faceplate



24729

- 5** Insert the ONU and faceplate assembly into the MNTS-A shelf and tighten the 2 panel screws. See [Figure 32](#).

**Figure 32** ONU and faceplate in MNTS-A shelf



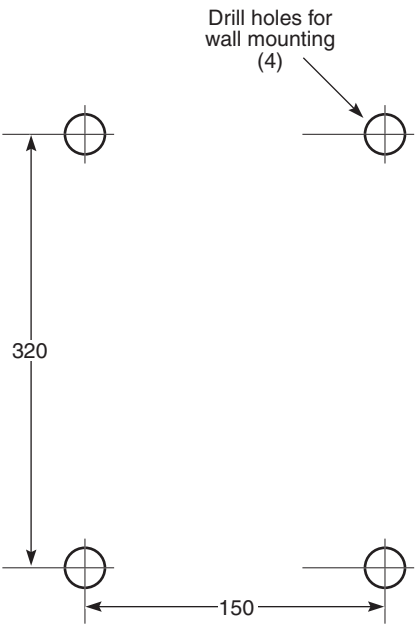
24730

**6** Repeat steps [2](#), [3](#), [4](#), and [5](#) for any additional ONUs.

**7** Mount the shelf into a 19-inch rack or to a wall.

For wall mounting, drill holes in the wall at applicable distances, as shown in [Figure 33](#).

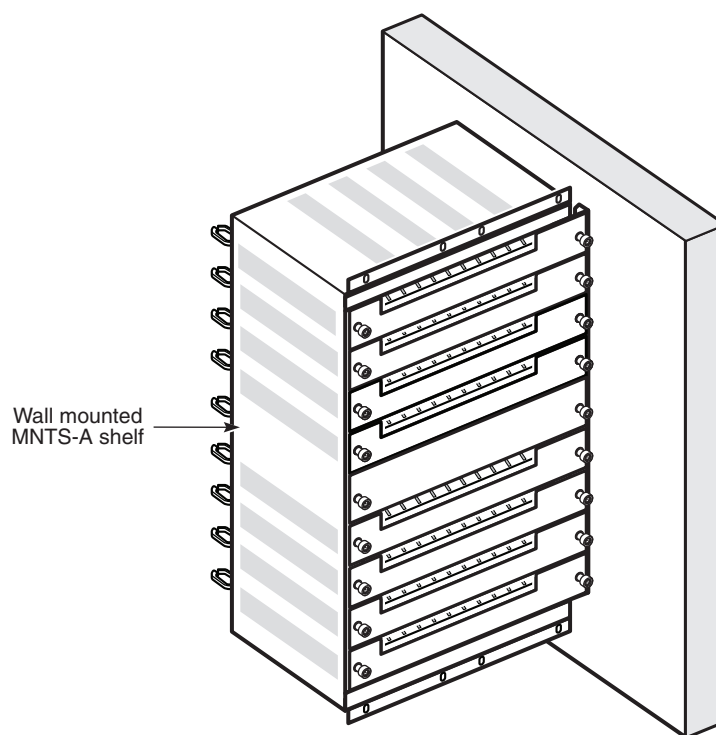
**Figure 33**     **Drill holes for wall mounting**



24731

Figure 34 shows a wall-mounted MNTS-A shelf.

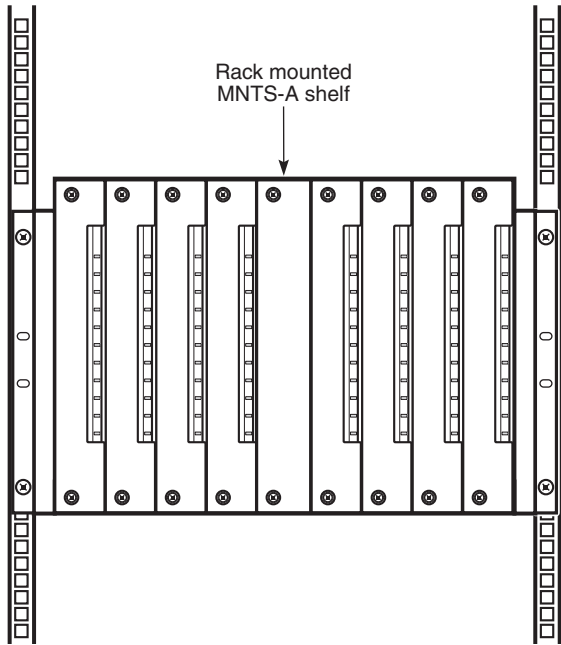
**Figure 34** Wall-mounted shelf



24732

Figure 35 shows a rack-mounted MNTS-A shelf.

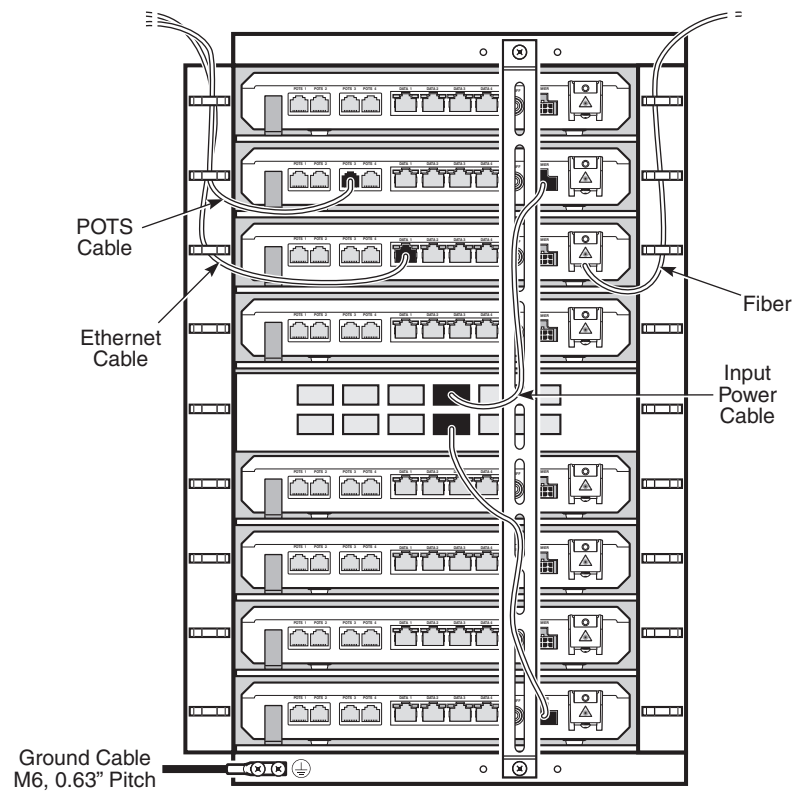
**Figure 35**      **Rack-mounted shelf**



24733

- 8**      Connect the ground cable and all ONU cables and fibers. See [Figure 36](#).

**Figure 36** Cable and fiber connections



24734

**9** STOP. This procedure is complete.





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# 7 Replace an E-240G-B ONU

## 7.1 Purpose

## 7.2 General

## 7.3 Prerequisites

## 7.4 Recommended tools

## 7.5 Safety information

## 7.6 ONU replacement procedure

## 7.7 ONU replacement in an MNTS-A shelf

## 7.1 Purpose

This chapter provides the steps to replace an E-240G-B ONU.

## 7.2 General

The steps listed in this chapter describe mounting and cabling for the E-240G-B ONU.

For more information about installing EPON ONUs, see the Operations and Commands manuals for your OLT.

## 7.3 Prerequisites

The prerequisites are:

- The ONU software version must be in the NT file system.
- All required cables must be present.

## 7.4 Recommended tools

You need the following tools for replacing the ONU:

- #2 Phillips screwdriver
- 1/4 in. (6 mm) flat blade screwdriver

- wire strippers
- fiber optic splicing tools
- RJ-45 cable plug crimp tool
- voltmeter or multimeter
- optical power meter
- drill and drill bits

## 7.5 Safety information

Read the following safety information before replacing the ONU.



**Danger 1** — Hazardous electrical voltages and currents can cause serious physical harm or death. Always use insulated tools and follow proper safety precautions when connecting or disconnecting power circuits.

**Danger 2** — Make sure all sources of power are turned off and have no live voltages present on feed lines or terminals. Use a voltmeter to measure for voltage before proceeding.

**Danger 3** — Always contact the local utility company before connecting the enclosure to the utilities.



**Warning** — This equipment is ESD sensitive. Proper ESD protections should be used when removing the fiber access cover of the ONU.



**Caution** — Keep indoor ONUs out of direct sunlight. Prolonged exposure to direct sunlight can damage the ONU.



**Note 1** — Observe the local and national laws and regulations that may be applicable to this installation.

**Note 2** — The ONU should be installed in accordance with the applicable requirements of the NEC or CEC. Local authorities and practices take precedent when there is conflict between the local standard and the NEC or CEC.

**Note 3** — The ONU must be installed by qualified service personnel.

**Note 4** — See [E-240G-B detailed specifications](#) in the [E-240G-B unit data sheet](#) for the temperature ranges for ONUs.

## 7.6 ONU replacement procedure

Use this procedure to replace an E-240G-B ONU.

---

### 1 Deactivate the ONU services at the P-OLT.

If you are using the SLID feature, this step is not required. The ONU and the services can remain in service (IS).

- i Use the RTRV-ONU command to verify the ONU status and the associated services. Record the serial number or the SLID of the ONU displayed in the command output.

Example:

```
RTRV-ONU: :ONU-1-1-1-1-1;
```

- ii If the ONU is in service, place the ONU in OOS state.

Example:

```
ED-ONU: :ONU-1-1-1-1-1;
```

---

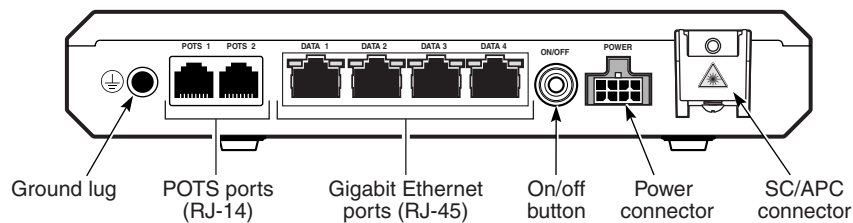
### 2 Power down the ONU by using the ON/OFF power switch.

---

### 3 Disconnect the POTS, Ethernet, power, and ground cables, if required, from the ONU; see Figure 37.

---

**Figure 37 E-240G-B ONU connections**



24108

---

### 4 Unplug the SC/APC fiber optic cable from the ONU.

- i Loosen the lock screw on the fiber optic connection clip.
- ii Lift the connection clip up.
- iii Unplug the fiber optic cable with SC/APC adapter from the fiber optic connector located on the back of the E-240G-B ONU as shown in Figure 37.
- iv Lower the clip and tighten the lock screw.

---

**5** Replace the ONU with a new unit:

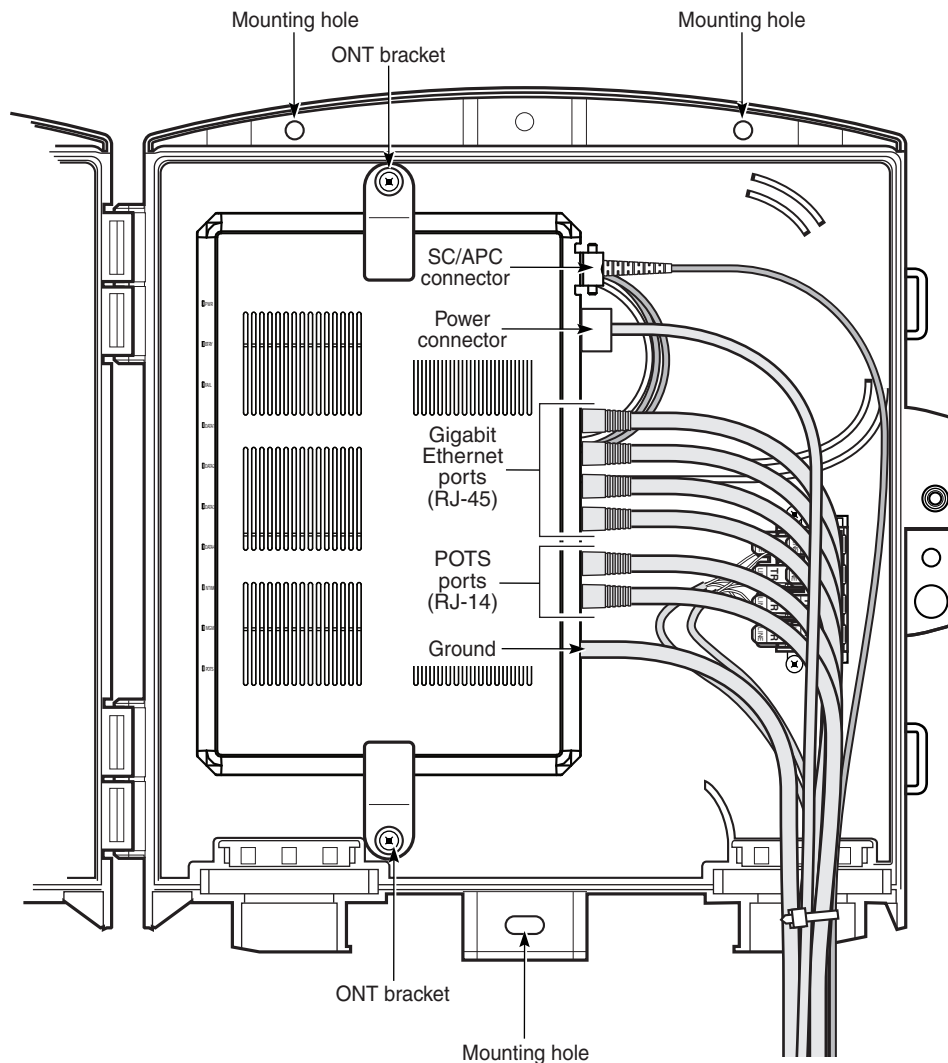
- a** On a flat surface, such as a desk, substitute a replacement ONU for the old ONU; go to step [7](#).
- b** On a wall.



**Note —** If the Emerson 24W AC/DC Power Adapter, CyberPower CS27 UPS, or Delta DUPS-1232GA will be used, the ONU must be mounted a minimum of 31.5 in (0.8 m) above the floor.

If the Delta DUPS-1232A will be used, the ONU must be mounted a minimum of 59 in (1.5 m) above the floor.

- i** Slide the old ONU upward and then away from the two mounting screws until the ONU is free of the wall.
  - ii** Slide the wall mount keyholes on the ONU enclosure or fiber storage tray of the replacement ONU down over the mounting screws until it is securely seated.
- c** In a wall-mounted outdoor enclosure.
- i** Unfasten the E-240G-B ONU by turning the brackets to the open position (as shown in Figure [38](#)) and remove the unit.

**Figure 38** E-240G-B ONU mounted in an outdoor enclosure

24110

- ii Position the replacement E-240G-B ONU within the outdoor enclosure and between the ONU brackets, as shown in Figure 38.
- iii Secure the E-240G-B ONU by turning the brackets to the closed position.



**Warning** — Do not overtighten the ONU bracket when securing the E-240G-B ONU to the outdoor enclosure. The unit can become skewed and compromise the environmental seal of the ONU mounted in the outdoor enclosure.

---

**6** To ground an E-240G-B ONU:

**Danger 1** — Hazardous electrical voltages and currents can cause serious physical harm or death. Always use insulated tools and follow proper safety precautions when connecting or disconnecting power circuits. For more information on grounding safety, see the Appendix - [Grounding safety](#).

**Danger 2** — Make sure all sources of power are turned off and have no live voltages present on feed lines or terminals. Use a voltmeter to measure for voltage before proceeding.

**Danger 3** — Always contact the local utility company before connecting the enclosure to the utilities.

- a** An indoor desktop or wall-mounted E-240G-B ONU is grounded by the 3-pin power adapter or a grounded UPS.



**Warning** — Do not connect the ground lug of the E-240G-B ONU for indoor installations; the ONU is grounded by the power adapter or UPS.

- b** An E-240G-B ONU mounted in an outdoor enclosure must be grounded with a permanent ground wire.

Connect a single #6 to #14 AWG ground wire to the recessed ground lug on the E-240G-B ONU; see Figure 38. The ground wire exits from the back of the ONU in the same way as the cables.

- 
- 7** Route up to four Ethernet cables to the RJ-45 ports, as shown in Figure 37 and Figure 38. Connect the Ethernet cables.

- 
- 8** Route up to two POTS cables to the RJ-14 ports, as shown in Figure 37 and Figure 38. Connect the POTS cables.

- 
- 9** If required, have approved service personnel who are trained to work with optic fiber clean the fiber optic connection. See the *7368 ISAM ONT Configuration, Management, and Troubleshooting Guide* for more information about fiber optic handling, inspection, and cleaning.



**Danger** — Fiber optic cables transmit invisible laser light. To avoid eye damage or blindness, never look directly into fibers, connectors, or adapters.

---

**10** Connect the fiber optic cable to an E-240G-B ONU.

**Warning** — Be careful to maintain a bend radius of no less than 1.5 inches (3.8 cm) when connecting the fiber optic cable. Too small of a bend radius in the cable can result in damage to the optic fiber.

- i Route the fiber optic cable to the ONU.
- ii Loosen the lock screw on the fiber optic connection clip.
- iii Lift the connection clip up.
- iv Plug the fiber optic cable with SC/APC adapter into the fiber optic connector located on the back of the E-240G-B, as show in Figures [37](#) and [38](#).
- v Lower the clip so that it secures the fiber optic cable.
- vi Tighten the lock screw.

---

**11** Install the power supply according to manufacturer specifications.

**Warning** — ONUs must be powered by a Listed or CE approved and marked limited power source power supply with a minimum output rate of 12 V dc, 1.25 A.

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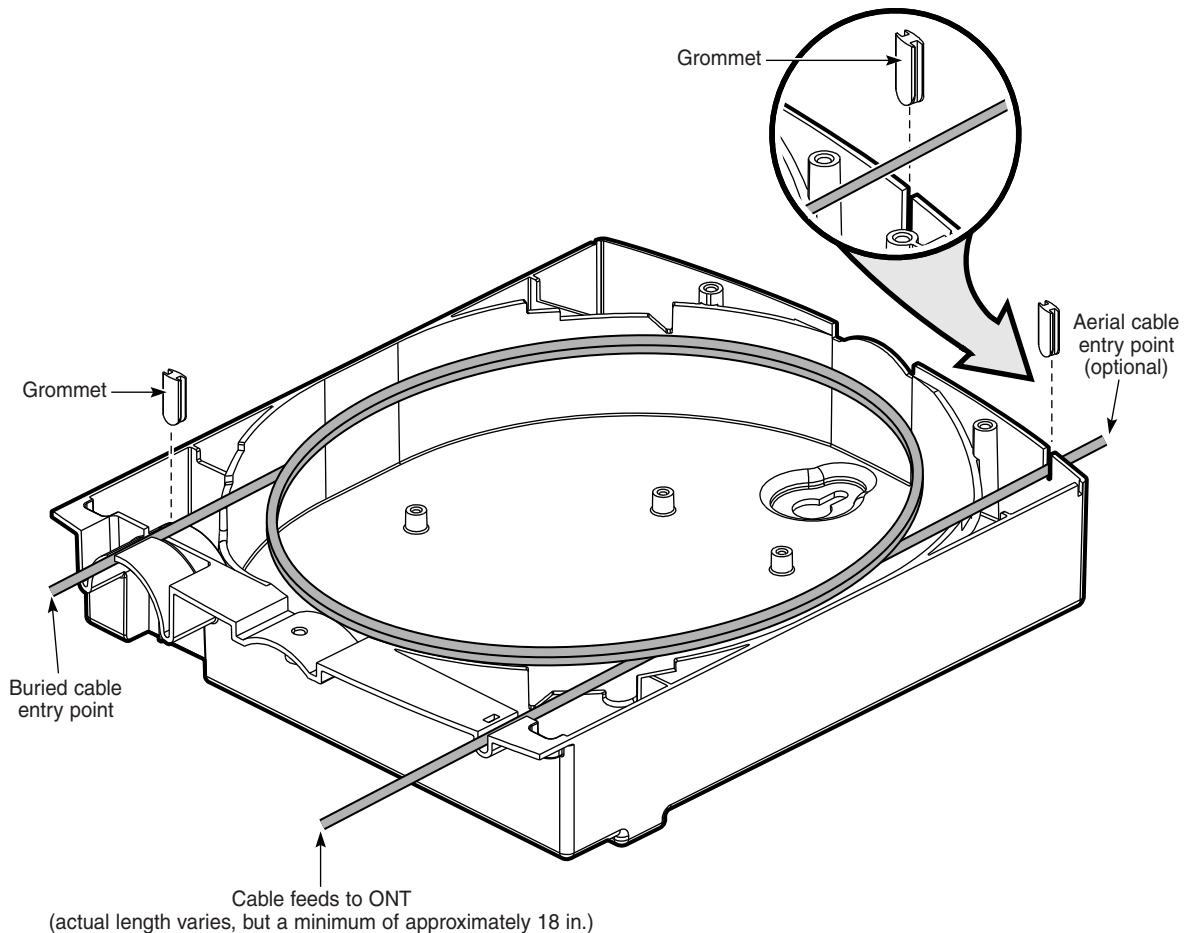
**12** Connect the power cable with an 8-pin Molex connector or 3-pin power adapter to the ONU.

---

**13** For an E-240G-B ONU installed in an outdoor enclosure with an FSST, coil the excess cable in a clockwise direction allowing it to exit the lower right cable exit port; see Figure [39](#).

**Note** — Observe the following:

- There must be approximately 18 in. (45.72 cm) of cable stub exiting the FSST at the right cable exit point.
- The FSST stores a maximum of 75 ft (22.86 m) of cable.

**Figure 39** Coiled cable routing (open view)

18812

- 14 Power up the ONU by using the ON/OFF power switch.
- 15 For information on downloading, activating, and committing ONU software for an E-240G-B ONU, see the Operations and Commands manuals for your OLT.
- 16 Activate and test the services; see the *7368 Hardware and Cabling Installation Guide*.
- 17 For an E-240G-B ONU installed in an outdoor enclosure, close the access cover of the outdoor enclosure and secure using the pin-in-hex screw.
- 18 STOP. This procedure is complete.



---

## 7.7 ONU replacement in an MNTS-A shelf

This section describes the additional steps required to replace an ONU in an MNTS-A shelf.

For more details, and for illustrations, see [“ONU mounting in an MNTS-A shelf”](#) in the previous chapter [“Install an E-240G-B ONU”](#).

- 
- 1 Make sure all cables are unplugged from the ONU, including the PON and power.



**Danger** — Fiber optic cables transmit invisible laser light. To avoid eye damage or blindness, never look directly into fibers, connectors, or adapters.



**Caution** — Be careful not to damage the PON connector.

- 
- 2 Loosen the two panel screws on the faceplate and slide out the ONU and faceplate assembly from the shelf.
- 
- 3 Loosen the ground lug on the faceplate.
- 
- 4 Unlock the tabs.
- 
- 5 Slide the ONU out of the faceplate.
- 
- 6 Remove the ground lug from the faceplate and install it in the new ONU.



**Note** — If you are removing the ONU but not replacing it at this time, leave the ground lug on the faceplate.

- 
- 7 Place the new ONU on the faceplate, making sure that the 4 tabs on the bottom of the faceplate are inserted into the ONU.
- 
- 8 Slide the ONU to the appropriate position.
- 
- 9 Make sure all tabs are locked.
- 
- 10 Tighten the ground lug with an M5 screw.

- 
- 11** Insert the ONU and faceplate assembly into the MNTS-A shelf and tighten the 2 panel screws.
- 

- 12** Reconnect the user cables, the power cable, and the PON cable.
- 



**Warning** — Be careful to maintain a bend radius of no less than 1.5 inches (3.8 cm) when connecting the fiber optic cable. Too small of a bend radius in the cable can result in damage to the optic fiber.



**Caution** — Be careful not to damage the PON connector. Consider cleaning the connector before you insert it.

- 
- 13** Repeat this procedure for any additional ONUs in the shelf that need to be replaced.
- 

- 14** STOP. This procedure is complete.
-

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## 8 Configure an E-240G-B ONU

### 8.1 General

### 8.1 General

Please refer to the configuration information provided with your OLT for the software configuration procedure for an E-240G-B ONU.

For HTTP configuration procedures, please refer to the *7368 ISAM ONT Configuration, Management, and Troubleshooting Guide*.



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## 9 Grounding safety

### 9.1 Grounding safety

## 9.1 Grounding safety

Improper grounding can result in personal injury or equipment damage. See below for specific dangers and considerations when handling grounding equipment.



**Danger 1** — Hazardous electrical voltages and currents can cause serious physical harm or death. Always use insulated tools and follow proper safety precautions when connecting or disconnecting power circuits.

**Danger 2** — Make sure all sources of power are turned off and have no live voltages present on feed lines or terminals. Use a voltmeter to measure for voltage before proceeding.

**Danger 3** — Always contact the local utility company before connecting the enclosure to the utilities.

**Danger 4** — You must connect the ONU to earth ground before connecting the power supply to the ONU.

**Danger 5** — The earth bonding terminal shall be connected to an approved earth connection before the ac power is applied.

**Danger 6** — Earthing and bonding of the ONU must comply with the ANSI-specific requirements found in NEC Article 250.

- Insulation - The grounding conductor must be insulated and listed as suitable for the purpose.
- Material - The grounding conductor shall be copper or other corrosion-resistant conductive material stranded or solid.
- Size - The grounding conductor must be a minimum of 14 AWG per UL investigation. If local code or regulations require more, follow per local codes or regulation.
- Length - The primary protector grounding conductor must be as short as practicable. In one- and two-family dwellings, the primary protector grounding conductor must be as short as practicable, not to exceed 20 ft (6.0 m) in length.
- If the building or structure served has no grounding means, as described in 800.100 (B)(1) or (B)(2)(1) of NEC Article 250, the communications grounding conductor must be connected to either of the following:
  - a) to any one of the individual electrodes described in 250.52 (A)(1), (A)(2), (A)(3), or (A)(4).
  - b) to an effectively grounded metal structure or to a ground rod or pipe not less than 5 ft (1.5 m) in length and 1/2 in. (12.7 mm) in diameter, driven, where practical, into permanently damp earth, and the communications ground rod shall be bonded to the power grounding electrode system in accordance with 800.100 (D).



**Warning 1** — This equipment is ESD sensitive. Proper ESD protection must be used when entering the TELCO Access portion of the ONU.

**Warning 2** — ANSI-specific: If using cable other than the recommended brands, select only UL-listed cable, rated for the specific installation.

**Warning 3** — The communications grounding electrode must be separated from lightning conductors as specified in 800.53 and at least 6 ft (1.8 m) from electrodes of other systems. Steam or hot water pipes or air terminal conductors (lightning-rod conductors) shall not be employed as electrodes for protectors.



**Note 1** — Earthing and bonding of the outdoor ONU must comply with the ETSI-specific requirements found in local electrical wiring codes.

**Note 2** — Observe all local and national laws and regulations that may be applicable to this installation.





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