NOKIA

Nokia ONT

BGW320-505

BGW320-505 Product Guide

3FE-47753-AAAA-TCZZA

Issue 3

June 2022

Legal notice

Nokia is committed to diversity and inclusion. We are continuously reviewing our customer documentation and consulting with standards bodies to ensure that terminology is inclusive and aligned with the industry. Our future customer documentation will be updated accordingly.

Contents

About this document

Purpose

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

Intended audience

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

The reader must be familiar with general telecommunications principles.

Safety information

For your safety, this document contains safety statements. Safety statements are given at points where risks of damage to personnel, equipment, and operation may exist. Failure to follow the directions in a safety statement may result in serious consequences.

Safety Information Examples

DANGER

Hazard

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

Equipment Damage

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

CAUTION

Service Disruption

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.

Acronyms and initialisms

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

Nokia quality processes

Nokia's ONT manufacturing, testing, and inspecting 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.

Documents

Documents are available using ALED or OLCS.

To download a ZIP file package of the customer documentation

1

Navigate to http://customer.nokia.com/s/ 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

Select **Products**.

3

Type your product name in the **Find and select a product** field and click the search icon. Select a product.

4

Click **Downloads: ALED** to go to the Electronic Delivery: Downloads page.

5

Select **Documentation** from the list.

6

Select a release from the list.

7

Follow the on-screen directions to download the file.

End of steps

To access individual documents

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

1

Navigate to http://customer.nokia.com/s/ 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

Select **Products**.

3

Type your product name in the **Find and select a product** field and click the search icon. Select a product.

4

Click **Documentation: Doc Center** to go to the product page in the Doc Center.

5

Select a release from the **Release** list and click **SEARCH**.

6

Click on the PDF icon to open or save the file.

End of steps

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.

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.

End of steps

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:

a. This is the first substep.

b. This is the second substep.

c. This is the third substep.

2

You must perform this step.

End of steps

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.

To search multiple PDF files for a common term

1

Open Adobe Acrobat Reader.

2

Choose **Edit→Search** from the Acrobat Reader main menu. The Search PDF panel displays.

3

Enter the search criteria.

4

Select **All PDF Documents In**.

5

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

6

Click **Search**.

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

End of steps

Technical support

For details, refer to the Nokia Support portal (https://customer.nokia.com/support/s/).

For ordering information, contact your Nokia sales representative.

How to comment

To comment on this document, go to the Online Comment Form (https://documentation.nokia.com/comments/) or e-mail your comments to the Comments Hotline (mailto:comments@nokia.com).

1 What's new

1.1 Overview

1.1.1 Purpose

This chapter provides the details of features and other documentation changes updated in the product guide in each release.

1.1.2 Contents

1.2 What's new in BBD Release 22.02

Table 1-1, "What's new in BBD Release 22.02" (p. 11) lists the new features and enhancements added to the BGW320-505 product guide in Issue 3.

Table 1-1 What's new in BBD Release 22.02

Feature/enhancement	Description	See
New features/enhancements		
BGW320-505 pluggable optics supply details for customer specific variants.	Added the ordering kit part number (3FE 46901 AC) for pluggable optics.	Table 3-3, "BGW320-505 pluggable optics" (p. 20)

2 ANSI ONT 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.

2.1 Safety instructions

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

2.1.1 Safety instruction boxes in customer documentation

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

The following is an example of the Danger box.

DANGER

Hazard

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

Equipment Damage

Possibility of equipment damage.

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

Service Disruption

Possibility of service interruption.

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 ONTs. It does not provide safety-related instructions.

2.1.2 Safety-related labels

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

The following table provides examples of the text in the various ONT safety labels.

Table 2-1 Safety labels

Description	Label text
CE marking	There are various CE symbols for CE compliance.

2.2 Safety standards compliance

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

WARNING

Equipment Damage

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.

2.2.1 EMC, EMI, and ESD standards compliance

The ONT equipment complies with the following requirements:

- Federal Communications Commission (FCC) CFR 47, Part 15, Subpart B, Subpart C, and Subpart E, Class A requirements for OLT equipment
- EN 61000-4-4 Testing and measurement techniques - Electrical fast transient/burst immunity test

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.

2.2.2 Equipment safety standard compliance

The ONT equipment complies with the requirements of UL60950-1 and Indoor ONTs to Information Technology Equipment (ITE).

2.2.3 Environmental standards compliance

The ONT equipment complies with the following standards:

- SPS-1019_Reliability_Env_Mech v2_5_REL_07-17-17 Section 6 Environmental Requirements

2.2.4 Resistibility requirements compliance

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

2.3 Electrical safety guidelines

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

Note: The ONTs 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.

2.3.1 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.

2.3.2 Cabling

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

- Use only cables approved by the relevant national electrical code.
- The ONTs 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).

2.3.3 Protective earth

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

2.4 ESD safety guidelines

The ONT equipment is sensitive to ESD. While the BGW320-505 product is designed to operate per specifications, the product might be installed in a location which exceeds them. Do not install the BGW320-505 in an area with high humidity or where there is high chance of ESD.

CAUTION

Service Disruption

This equipment is ESD sensitive. End users should not attempt to open the BGW320-505 enclosure.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This equipment complies with FCC radiation exposure limits as set forth for an uncontrolled environment. This equipment should be installed and operated maintaining a minimum distance of 54 cm (21.25 inches) between the device and your body.

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 ONT equipment. In addition, you must control relative humidity, use static dissipating material for furniture or flooring, and restrict the use of air conditioning.

2.5 Laser safety guidelines

Observe the following instructions when you perform installation, operations, and maintenance tasks on the ONT 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

Hazard

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

Hazard

Possibility of equipment damage. Risk of eye damage by laser radiation.

2.5.1 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 exposed to a laser beam. Operating personnel must observe the instructions on the laser explanatory label before plugging in the optical module.

DANGER

Hazard

Risk of eye damage by laser radiation.

2.5.2 Location class

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

3 BGW320-505 unit data sheet

3.1 Overview

3.1.1 Purpose

3.1.2 Contents

3.2 BGW320-505 part numbers and identification

Table 3-1, “Identification of BGW320-505 indoor ONT” (p. 19) provides part numbers and identification information for the BGW320-505 indoor ONT.

Table 3-1 Identification of BGW320-505 indoor ONT

Ordering kit part number	Provisioning number	Description	CLEI	CPR	ECI/ Bar code
3FE 48263 AA (Customer-specific variant)	3FE 47753 AA	Package P ONT unit with one RJ-14 dual voice port, three 1000/100/10 BaseT Ethernet interfaces, and one 5G/2.5G/1G/100M Ethernet port, all four as LAN ports and one 1G/100M/10M WAN Ethernet port. This ONT also supports 802.11b/g/n/ac tri-band Wi-Fi: 5 GHz low-band, 5 GHz high-band, and 2.4 GHz radios. This ONT has one USB 2.0 port with a Type A connector and has an SFP cage supporting pluggable SFP+ optical modules.	BVMG400BRA	—	474079

Table 3-1 Identification of BGW320-505 indoor ONT (continued)

Ordering kit part number	Provisioning number	Description	CLEI	CPR	ECI/ Bar code
3FE 48263 AB (Customer-specific variant)	3FE 47753 AB	Package P ONT unit with one RJ-14 dual voice port, three 1000/100/10 BaseT Ethernet interfaces, and one 5G/2.5G/1G/100M Ethernet port, all four as LAN ports and one 1G/100M/10M WAN Ethernet port. This ONT also supports 802.11b/g/n/ac tri-band Wi-Fi: 5 GHz low-band, 5 GHz high-band, and 2.4 GHz radios. This ONT has one USB 2.0 port with a Type A connector and has an SFP cage supporting pluggable SFP+ optical modules. Comes with a 2-pin AC/DC U.S. power adapter with AC cable.	BVMGX10BRA	—	475267

Table 3-2, “Supported power adapters” (p. 20) provides information on supported power adapters.

Table 3-2 Supported power adapters

Part number	Description
1AF 32246 AA	Power supply unit, Delta EPS48R0-16, US Plug, 2-Pin, 12V, 4A, L6, Surge 6KV. Includes DC power cord. Included with ONT.
1AF 32246 BA	Power supply unit, Delta EPS48R1-16, US Plug, 2-Pin, 12V, 4A, L6, Surge 6KV. Includes DC power cord. Included with ONT.

Table 3-3, “BGW320-505 pluggable optics” (p. 20) provides optics ordering information for BGW320-505 ONTs. These pluggable optics modules can be ordered separately.

Table 3-3 BGW320-505 pluggable optics

Part number	Type	Description
3FE 46899 AB	GPON	SFP+ GPON optical module, SC/APC, Industrial-Temp
3FE 46900 AB	Alt-Optic GPON	SFP+ Alt-Optic GPON optical module, SC/APC, Industrial-Temp
3FE 46901 AC	XGS PON	SFP+ XGS 10G GPON optical module, SC/APC, Industrial-Temp

3.3 BGW320-505 general description

BGW320-505 ONTs are designed to cater to business and residential customer requirements. The ONT offers data and video services to the subscriber.

When used with an appropriate pluggable SFP+ PON module in the ONT’s SFP cage, the BGW320-505 indoor ONT provides the subscriber interface for the network by terminating the PON interface and converting it to user interfaces that directly connect to subscriber devices.

The ONT is compatible with all existing subscriber equipment, including analog phones with rotary dial capability, cordless phones, modems, fax machines, and caller ID boxes (Type I, Type II, and Type III).

For LAN Ethernet interfaces, the BGW320-505 ONT feature one 5G Ethernet port and provides three 1000/100/10 BaseT Ethernet ports. For the WAN there is an optional 1000/100/10 BaseT Ethernet port labeled ONT. And for Wi-Fi, the ONT supports 802.11ax tribands of 5 GHz low-band, 5 GHz high-band, and 2.4 GHz.

The ONT provides one POTS port with one dual-voice port RJ-14 connector.

The ONT also features a power supply connection, a reset button, one USB 2.0 Type A port, and Wi-Fi Protected Setup (WPS) button. Use the WPS button to enable the WPS discovery mode of new Wi-Fi devices.

BGW320-505 ONTs can be placed on a flat surface, such as a desk or shelf.

Figure 3-1, “BGW320-505 ONT unit” (p. 20) through Figure 3-7, “BGW320-505 ONT back view (connections)” (p. 25) show the different views of the BGW320-505 ONT.

Figure 3-1 BGW320-505 ONT unit

Figure 3-2 BGW320-505 ONT top view

Top view

Figure 3-3 BGW320-505 ONT front view

Front view

Figure 3-4 BGW320-505 ONT left view

Left view

Figure 3-5 BGW320-505 ONT right view

Figure 3-6 BGW320-505 ONT bottom view

Note: The values shown in the Figure 3-6, “BGW320-505 ONT bottom view” (p. 24) is for illustration purpose only and not the real time values.

Figure 3-7 BGW320-505 ONT back view (connections)

BGW320-505 indoor ONTs provide the following functions:

- Blue color 5 Gbps interface supports 5G/2.5G/1G/100M auto negotiation
- Three yellow 1000/100/10 Base T Ethernet ports with auto negotiation and MDI/MDIX auto sensing, one red ONT Ethernet uplink WAN port supporting 1000/100/10 BaseT Ethernet
- One POTS port for carrier grade voice services
- One USB 2.0 Type A port
- Triple-Play services type, including voice, video and high-speed Internet access
- Traffic classification and QoS capability
- Support for fax services
- Built-in layer 2 switch; Line Rate L2 traffic
- 1 GB RAM and 4 GB EMMC memory card in the board
- IP video distribution
- Optics that support received signal strength indication (RSSI)
- Supports 802.11ac, 802.11g, 802.11n, and 802.11ax

- WPS with a push button
- 64/128 WEP encryption
- WPA, WPA-PSK/TKIP
- WPA2, WPA2-PSK/AES
- VLAN tagging/detagging and marking/remarking of IEEE 802.1p per Ethernet port
- Dying gasp support
- SIP voice support
- DTMF dialing
- Echo cancellation (G.168)
- Caller ID, call waiting, call hold, 3-way calling, call transfer, message waiting
- Forward Error Correction (FEC)
- Frame Check Sequence (FCS) error counter
- Support for multiple SSIDs (private and public instances)
- Routed mode per LAN port
- DHCP client/server
- DNS server/client
- Network Address Translation (NAT)
- Network Address Port Translation (NAPT)
- IGMP snooping and proxy (v2/v3)
- OMCI, TR-069, and Web GUI management support
- Performance monitoring and alarm reporting
- Remote software image downloading and activation
- IP/MAC/URL filter
- Multi-level firewall and ACL

3.3.1 TR69 authentication using TLS and CA certificates

BGW320-505 ONTs support TLS, as well as ACS authentication using SHA-256 pre-installed certificates.

If the URL is set to the https://... format, by default, the connection will use TLS without authentication mode. The ONT can also authenticate the ACS using a pre-installed CA certificate.

3.4 BGW320-505 software and installation feature support

For information on installing or replacing the BGW320-505, see:

- Chapter 4, “Install or replace a BGW320-505 indoor ONT”

For information on the following topics, see the **Nokia ONT Product Overview Guide**:

- Ethernet interface specifications
- POTS interface specifications

- RSSI specifications
- Wi-Fi specifications
- ONT optical budget
- ONT management using an ONT interface

3.5 BGW320-505 interfaces and interface capacity

The following table describes the supported interfaces and interface capacity for BGW320-505 indoor ONTs.

Table 3-4 BGW320-505 indoor ONT interface connection capacity

ONT type and model	Maximum capacity							
	1000/100/10 BaseT	5G/2.5G/ 1G/100M Ethernet port	5 GHz low-band Wi-Fi [1]	5 GHz high-band Wi-Fi [1]	2.4 GHz Wi-Fi [1]	RJ-14	SFP+	USB
BGW320-505	3 yellow LAN ports, 1 red WAN port	1	1	1	1	1	1	1

Notes:

1. Supported wirelessly over the IP service.

3.5.1 BGW320-505 connections and components

Figure 3-8 BGW320-505 Physical connections

Table 3-5, “BGW320-505 indoor ONT physical connections” (p. 28) describes the physical connections for the BGW320-505 indoor ONT.

Table 3-5 BGW320-505 indoor ONT physical connections

Connection	Description
ONT	One optional uplink WAN Ethernet RJ-45 port colored red and labeled ONT. The ONT connection provides Ethernet access to home, Internet access, and POTS services. The ONT connection is red and located at the top of the connections.
Ethernet ports (LAN 1 to 4 -three GE and one 5 GE)	These connections are provided through Ethernet RJ-45 cables. Up to three 1000/100/10 Base-T Ethernet interfaces are supported. The Ethernet ports can support both data and in-band video services on all four interfaces. These three ports are yellow and located in the middle of the connections. The 5G Ethernet port is also provided through an RJ-45 cable. One 5G connection is supported. This port is blue and located at the bottom of the connections.

Table 3-5 BGW320-505 indoor ONT physical connections (continued)

Connection	Description
Reset button	Pressing the Reset button for less than 10 seconds reboots the ONT; pressing the Reset button for 10 seconds resets the ONT to its factory defaults.
Phone (POTS)	This connection is provided through one RJ-14 POTS port.
Power input	This connection is provided through a power cable with a Delta Electronics EPS48R0-16 2-pin connector. Use only approved power adapters. The use of any non-approved power adapter may cause damage to persons or equipment. Make sure that all power cord connectors are securely and completely plugged into receptacles. Do not use the power adapter in an outdoor environment or any wet locations. Protect the power adapter from liquids. The conditions above may cause fire, short circuit, electrocution or shock injury.
USB	This connection is provided through one USB 2.0 Type A port. The voltage rate is 5V.
SFP	This connection is provided through a SFP+ cage that uses an optical fiber cable. One SFP+ connection is supported.
WPS button	This button enables the WPS discovery mode of new Wi-Fi devices.

3.6 BGW320-505 service LED

The front of the BGW320-505 functions has a multi-color service LED indicator. The LED color and pulse rate acts as a signal to the user, which indicates the state of the BGW320-505 and the quality of its backhaul link.

Table 3-6, “BGW320-505 service LED indications” (p. 29) provides the service LED description for the BGW320-505.

Table 3-6 BGW320-505 service LED indications

LED color	LED behavior	LED behavior description
Off	Off	Power off
White	White solid	IP service is established
	White flashing (Slow)	Attempting a broadband connection.
	White flashing (Fast)	Attempting an IEEE 802.1X authentication, or trying to obtain DHCP information.
Orange	Orange flashing	A software upgrade is in progress. A Power-On Self-Test (POST) is in progress.
Yellow	Yellow flashing	One or more configured VoIP lines are not registered with a SIP proxy server. No signal on a particular broadband connection. The connection is configured for use. No signal on one pair of a bonded-pair connection (as identified through manual or G.997.1 communication).

Table 3-6 BGW320-505 service LED indications (continued)

LED color	LED behavior	LED behavior description
Red	Red flashing (Slow)	Broadband connection fails to be established for more than three consecutive minutes, or there is no signal on all broadband connections.
	Red flashing (Fast)	The device is attempting to connect to an IP and failed.
	Red—POST failure (Not bootable)	A device malfunction has occurred or the device is overheating.

3.7 BGW320-505 detailed specifications

Table 3-7, “BGW320-505 indoor ONT physical specifications” (p. 30) lists the physical specifications for the BGW320-505 indoor ONT.

Table 3-7 BGW320-505 indoor ONT physical specifications

Description	Specification
Length	7.8 in. (200 mm)
Width	3.9 in. (100 mm)
Height	7.5 in. (191 mm)
Weight [within ± 0.5 lb (0.23 kg)]	3.8 lb (1.742 kg)

Table 3-8, “BGW320-505 indoor ONT power consumption specifications” (p. 30) lists the power consumption specifications for the BGW320-505 indoor ONT.

Table 3-8 BGW320-505 indoor ONT power consumption specifications

Mnemonic	Maximum power (Not to exceed)	Condition	Minimum power	Condition
BGW320-505	41.73 W	12 VDC when all ports operating with full loading, dual 5x REN	9.66 W	Idle

Table 3-9, “BGW320-505 indoor ONT environmental specifications” (p. 30) lists the environmental specifications for the BGW320-505 indoor ONT.

Table 3-9 BGW320-505 indoor ONT environmental specifications

Mounting method	Temperature range and humidity	Altitude
Desk or shelf	Operating: 32°F to 107°F (0°C to +41.7°C) ambient temperature 5% to 95% relative humidity, non-condensing at 40°C	Contact your Nokia technical support representative for more information

3.8 BGW320-505 GEM ports and T-CONTs

Table 3-10, “BGW320-505 indoor ONT capacity for GEM ports and T-CONTs” (p. 30) lists the maximum number of supported T-CONTs and GEM ports.

Table 3-10 BGW320-505 indoor ONT capacity for GEM ports and T-CONTs

BGW320-505 ONT	Maximum	Notes
GEM ports per indoor ONT	256	—
T-CONTs per indoor ONT	40	—

3.9 BGW320-505 standards compliance

BGW320-505 indoor ONTs are compliant with the following standards:

- EN 61000-4-2 Testing and measurement techniques - Electrical fast transient/burst immunity test
- EN 61000-4-2 Testing and measurement techniques - Electrostatic discharge immunity test
- EN 61000-4-2 Testing and measurement techniques - Immunity to conducted disturbances induced by radio frequency fields
- EN 61000-4-2 Testing and measurement techniques - Radiated, radio frequency, electromagnetic field immunity test
- FCC CFR 47, Part 15, Subparts B, C, and E.

3.9.1 Responsible party

Table 3-11, “Responsible party contact information” (p. 31) lists the party in the US responsible for this ONT.

Table 3-11 Responsible party contact information

Legal Company name	Nokia Solutions and Networks OY	Nokia of America Corporation
Offices	Offices | Nokia (https://www.nokia.com/contact-us/offices/#north-america)	
Support	Business Support | Nokia (https://www.nokia.com/networks/business-support/)	
Other contacts	Contact us | Nokia (https://www.nokia.com/contact-us/)	

3.9.2 Energy-related products standby and off modes compliance

The BGW320-505 ONTS qualify as equipment with high network availability (HiNA) functionality. Since the main purpose of BGW320-505 ONTs 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 3.5 “BGW320-505 interfaces and interface capacity” (p. 27) in this chapter.

For information about power consumption, see 3.7 “BGW320-505 detailed specifications” (p. 30) in this chapter.

3.9.3 FCC statement

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

3.9.4 FCC Radiation Exposure Statement

This device complies with FCC radiation exposure limits set forth for an uncontrolled environment and it also complies with Part 15 of the FCC RF Rules. This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 54 cm (21.25 inches) from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provided with antenna installation instructions and consider removing the no-collocation 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, and
2. This device must accept any interference received, including interference that may cause undesired operation.

CAUTION

Service Disruption

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

3.10 BGW320-505 special considerations

BGW320-505 are package P ONTs.

3.10.1 Wi-Fi service

BGW320-505 indoor ONTs feature Wi-Fi service as well as voice and data services. Wi-Fi is a wireless networking technology that uses radio waves to provide wireless HSI and network

connections. This ONT complies with the IEEE 802.11 standards, which the Wi-Fi Alliance defines as the basis for Wi-Fi technology.

Wi-Fi physical features

BGW320-505 indoor ONTs have one WPS push button (located on the front of the ONT) that enables the WPS discovery mode of new Wi-Fi devices.

Wi-Fi standards and certifications

The Wi-Fi service on BGW320-505 indoor ONTs supports the following IEEE standards and Wi-Fi Alliance certifications:

- Certified for Wi-Fi 802.11ac/b/g/n/ax standards
- WPA support including WPA-PSK
- Certified for WPA2-Personal

Wi-Fi GUI features

BGW320-505 indoor ONTs have HTML-based Wi-Fi configuration GUIs.

3.10.2 BGW320-505 ONT considerations and limitations

The following table lists the considerations and limitations for Package P BGW320-505 ONTs.

Table 3-12 BGW320-505 ONT considerations and limitations

Considerations and limitations
This device is restricted to indoor use in accordance with proper ventilation (as described in Step Step 1 of Section 4.4 "Install a BGW320-505 indoor ONT" (p. 36) of the Chapter 4, "Install or replace a BGW320-505 indoor ONT", and temperature requirements, as described in Section 3.7 "BGW320-505 detailed specifications" (p. 30).

4 Install or replace a BGW320-505 indoor ONT

4.1 Overview

4.1.1 Purpose

This chapter provides the steps to:

- Install a BGW320-505 indoor ONT
- Replace a BGW320-505 indoor ONT

4.1.2 Contents

4.2 Prerequisites

Ensure that you have all required cables.

4.3 Safety information

Read the following safety information before installing the unit.

DANGER

Hazard

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.

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.

Always contact the local utility company before connecting the enclosure to the utilities.

WARNING

Equipment Damage

This equipment is ESD sensitive. Proper ESD protections should be used when removing the fiber access cover of the indoor ONT.

Do not directly connect the 10G PON ONT to the 10G PON OLT.

CAUTION

Service Disruption

Keep indoor ONTs out of direct sunlight. Prolonged exposure to direct sunlight can damage the unit.

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

Observe the following:

- The indoor ONT 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.
- The indoor ONT may require the presence of a fiber termination, which must be installed by qualified service personnel.
- Indoor ONTs must be installed with cables that are suitably rated and listed for indoor use.
- See the detailed specifications in the Chapter 3, “BGW320-505 unit data sheet” for the temperature ranges for these ONTs.

4.4 Install a BGW320-505 indoor ONT

1

WARNING

Equipment Damage

There is a risk of overheating if the BGW320 is not properly ventilated. The unit should not be placed in an enclosed cabinet or location without proper ventilation.

Make sure the temperature requirement described in Section 3.7 “BGW320-505 detailed specifications” (p. 30) are adhered to.

Place the indoor ONT unit on a flat surface, such as a desk or shelf.

Note: The BGW320-505 ONT cannot be stacked with another ONT or with other equipment. The ONT mounting requirements are:

- Place the unit in a vertical upright position with the feet and grill facing down and the flat top facing up
- Allow a minimum 100 mm clearance above the top cover

- Do not place any heat source directly above the top cover or below the bottom cover

2

Review the connection locations, as shown in Figure 4-1, “BGW320-505 ONT connections” (p. 36).

Figure 4-1 BGW320-505 ONT connections

3

Connect the Ethernet cables to the ONT and GE ports; see Figure 4-1, “BGW320-505 ONT connections” (p. 37) for the location of these ports.

4

Connect a telephone to the RJ-14 POTS port.

Contact your service provider for details, especially if you have an alarm system.

5

DANGER

Hazard

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

WARNING

Equipment Damage

Be careful to maintain a bend radius of no less than 1.5 in. (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.

Connect the fiber optic cable with an SFP adapter into the SFP+ connector; see Figure 4-1, “BGW320-505 ONT connections” (p. 37) for the location of the SFP connector.

Note: Fiber cable preparation varies depending on the type and size of the inside or outside plant fiber cable being spliced to the SC/APC fiber optic pigtail cable.

6

Install the power supply according to manufacturer specifications.

Note: Observe the following:

- Units must be powered by a Listed or CE approved and marked limited power source power supply with a minimum output rate of 12VDC, 4A.

7

Power up the ONT unit by inserting the power cable.

8

If applicable, use the WPS button to connect additional Wi-Fi devices to the ONT.

9

Verify the ONT LEDs; see 3.6 “BGW320-505 service LED” (p. 29) for a description of the LEDs.

10

Test the services by connecting to your device (cell phone, laptop, or computer) and access a well known web-site.

11

If necessary, reset the ONT.

a. Locate the Reset button on a BGW320-505 indoor ONT as shown in Figure 4-1, “BGW320-

505 ONT connections" (p. 40).

b. Press the Reset button for less than 10 seconds to reboot the ONT.

Press the Reset button for 10 seconds to reset the ONT to its factory defaults.

END OF STEPS

4.5 Replace a BGW320-505 indoor ONT

1

Deactivate the ONT services at the P-OLT.

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

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

Example:

```
RTRV-ONT::ONT-1-1-1-1-1;
```

b. If the ONT is in service, place the ONT in OOS state.

Example:

```
ED-ONT::ONT-1-1-1-1-1;
```

2

Power down the unit by disconnecting the power cable; see Figure 4-2, "BGW320-505 ONT connections" (p. 38) for the power input.

Figure 4-2 BGW320-505 ONT connections

3

Disconnect the telephone from the RJ-14 POTS port.

4

DANGER

Hazard

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

Disconnect the fiber optic cable with an SFP adapter from the SFP+ connector.

a. Unplug the fiber optic cable from the SFP+ connector.

b. Attach a fiber dust cover to the end of the SFP+ connector.

5

Replace the ONT with a new unit. For details, Chapter 4, “Install or replace a BGW320-505 indoor ONT”.

6

Connect the Ethernet cables to the ONT and GE ports; see Figure 4-2, “BGW320-505 ONT connections” (p. 40) for the location of these ports.

7

Connect a telephone to the RJ-14 POTS port.

Contact your service provider for details, especially if you have an alarm system.

8

DANGER

Hazard

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

WARNING

Equipment Damage

Be careful to maintain a bend radius of no less than 1.5 in. (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.

Connect the fiber optic cable with the SFP adapter into the SFP connector. Figure 4-2, “BGW320-505 ONT connections” (p. 40) shows the location of the fiber optic connector.

9

Install the power supply according to manufacturer specifications.

Note: Observe the following:

- Units must be powered by a Listed or CE approved and marked limited power source power supply with a minimum output rate of 12VDC, 4A.

10

Power up the unit by connecting the power cable; see Figure 4-2, “BGW320-505 ONT connections” (p. 40) for the location of the power input.

11

If applicable, press the **WPS** button to enable the WPS discovery mode on new WiFi devices.

12

Verify the ONT LEDs, voltage status, and optical signal levels; see the *Nokia ONT/CPE Hardware and Cabling Installation Guide*.

13

Activate and test the services by connecting to your device (cell phone, laptop, or computer) and access a well known web-site.

14

If necessary, reset the ONT.

a. Locate the **Reset** button on a BGW320-505 indoor ONT as shown in Figure 4-2, “BGW320-505 ONT connections” (p. 40).

b. Press the **Reset** button for less than 10 seconds to reboot the ONT.

   Press the **Reset** button for 10 seconds to reset the ONT to its factory defaults.

END OF STEPS