

Zhone zNID 24xx Series Hardware Installation Guide

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Z H O N E

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ABOUT THIS GUIDE

This guide is intended for use by installation technicians, system administrators, or network administrators. It explains how to install the zNID 24xx series enclosure, electronics and cabling.

Style and notation conventions

This document uses the following conventions to alert users to information that is instructional, warns of potential damage to system equipment or data, and warns of potential injury or death. Carefully read and follow the instructions included in this document.



Caution: A caution alerts users to conditions or actions that could damage equipment or data.

Précaution : Une mention Précaution avertit les utilisateurs au sujet d'états ou d'actions qui pourraient endommager le matériel ou les données.



Note: A note provides important supplemental or amplified information.

Remarque : Une remarque fournit des informations supplémentaires ou amplifiées importantes.



Tip: A tip provides additional information that enables users to more readily complete their tasks.

Conseil : Un conseil fournit une information supplémentaire qui permet aux utilisateurs de réaliser leurs tâches plus facilement.



WARNING! A warning alerts users to conditions or actions that could lead to injury or death.

AVERTISSEMENT ! Un avertissement avertit les utilisateurs au sujet d'états ou d'actions qui pourraient entraîner des blessures voire la mort.



WARNING! A warning alerts users to conditions or actions that could lead to injury caused by a laser.

AVERTISSEMENT ! Un avertissement avertit les utilisateurs au sujet d'états ou d'actions qui pourraient entraîner des blessures causées par un laser.



WARNING! This icon warns the user that metal surfaces can become hot to touch. Avoid contact or use caution when touching these surfaces.

AVERTISSEMENT ! Cette icône prévient l'utilisateur que les surfaces métalliques peuvent devenir chaudes au toucher. Evitez le contact ou soyez prudent lorsque vous touchez ces surfaces.

Typographical conventions

The following typographical styles are used in this guide to represent specific types of information.

Bold	Used for names of buttons, dialog boxes, icons, menus, profiles when placed in body text, and property pages (or sheets). Also used for commands, options, parameters in body text, and user input in body text.
Fixed	Used in code examples for computer output, file names, path names, and the contents of online files or directories.
Fixed Bold	Used in code examples for text typed by users.
Fixed Bold Italic	Used in code examples for variable text typed by users.
<i>Italic</i>	Used for book titles, chapter titles, file path names, notes in body text requiring special attention, section titles, emphasized terms, and variables.
PLAIN UPPER CASE	Used for environment variables.

Related documentation

Refer to the following publication for additional information:

- zNID Quick Installation Instructions for the zNID you are installing. These instructions are shipped with the zNID, but are also available on the Zhone website.
- *zNID 24xx Configuration Guide* — explains how to use the zNID web interface and describes the system commands and parameters.

Refer to the release notes for software installation information and for changes in features and functionality of the product (if any).

Acronyms

The following acronyms are related to Zhone products and may appear throughout this manual:

Table 1: Acronyms and their descriptions

Acronym	Description
Active E	Active Ethernet, also known as Gigabit Ethernet
APC	Angled physical contact (for fiber connector)
Coax	Coaxial cable
CNI	Comfort Noise Insertion
CPE	Consumer Premises Equipment
DHCP server	Dynamic host configuration protocol server
EZ touch™	Zhone's implementation for managing CPEs and zNIDs
GigE	Gigabit Ethernet
GPON	Gigabit passive optical network
HPNA	Home phone line networking alliance
IPTV	Internet protocol TV
LED	Light-emitting diode
MALC	Multi-access line concentrator
MDU	Multiple Dwelling Unit
MIB	Management information bases
MoCA	Multimedia over Coax Alliance
OLT	Optical Line Terminator
ONT	Optical Network Terminator

Table 1: Acronyms and their descriptions (Continued)

Acronym	Description
ONU	Optical Network Unit
PoE	Power over Ethernet
PPPoE	Point-to-point protocol over Ethernet
QoS	Quality of service
RF	Radio Frequency
RFoG	Radio Frequency over Glass
SC adaptor	Subscriber connector adaptor
SIP	Session initiation protocol
SNMP	Simple network management protocol
T1/E1	T1 is Trunk line 1 (or DS 1, digital signal level 1). E1 is the European equivalent, though there are a number of differences between the North American T1 and the European E1.
UPC	Ultra physical contact (for fiber connector)
Wi-Fi	Wireless local area network (trademark of Wi-Fi alliance)
VAD	Voice Activity Detection
VOIP	Voice over IP
zNID	Zhone Network Interface Device
ZMS	Zhone Management System

Contacting Global Service and Support

Support for this product is provided by your Internet service provider

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 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.

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

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.

Déclaration FCC

Ce matériel a été testé et il a été conclu qu'il est conforme aux limites imposées aux appareils numériques de Classe B, conformément à la Partie 15 des Règles FCC. Ces limites sont établies pour fournir une protection raisonnable contre les interférences nuisibles dans une installation résidentielle. Ce matériel génère, utilise et peut irradier de l'énergie de fréquence radio et s'il n'est pas installé en conformité avec les instructions, il pourrait provoquer des interférences nuisibles avec les communications radio. Toutefois, il n'y a pas de garantie que des interférences ne se produiront jamais dans aucune installation. Si ce matériel provoque des interférences nuisibles à la réception de radio ou de télévision, ce qui peut être déterminé en éteignant et en rallumant l'appareil, nous recommandons à l'utilisateur d'essayer de corriger l'interférence via l'une des solutions suivantes :

- Réorienter ou déplacer l'antenne de réception.
- Augmenter l'écart entre l'appareil et le récepteur.
- Raccorder l'appareil à une prise sur un circuit différent de celui sur lequel le récepteur est connecté.

- Consulter le détaillant ou un technicien de radio/télévision pour obtenir de l'aide.

Précaution FCC : Tous les changements ou modifications non expressément approuvés par la partie responsable de la conformité pourraient rendre nul le droit d'usage de l'appareil par l'utilisateur.

Ce dispositif est conforme à la Partie 15 des Règles FCC. L'utilisation est sujette aux deux conditions suivantes : (1) cet appareil ne doit pas causer d'interférences nuisibles, et (2) cet appareil doit accepter toute interférence reçue, y compris des interférences pouvant provoquer un fonctionnement indésirable.

CE

CE compliance certifications has been obtained for the following equipment:

- ZNID-GPON-2402-XXX
- ZNID-GPON-2403-XXX
- ZNID-GPON-2424-XXX
- ZNID-GPON-2425-XXX
- ZNID-GPON-2426-XXX
- ZNID-GPON-2427-XXX
- ZNID-GE-2402-XXX
- ZNID-GE-2424-XXX
- ZNID-GE-2426-XXX

The xxx suffix, 2-3 alphanumeric characters identify the sales region or specific customer with customized LOGO or software.

The equipment named above is confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility (2004/108/EC), Low-voltage Directive (2006/95/EC) and R&TTE (1999/5/EC). The equipment passed the test which was performed according to the following European standards:

- ETSI EN 301 489-17 V2.1.1: 2009
- ETSI EN 301 489-1 V1.8.1: 2008
- ETSI EN 300 328 V1.7.1: 2006
- EN 62311: 2008
- EN 60950-1: 2006+A11 2009

Important Safety Instructions

Read and follow all warning notices and instructions marked on the product and included in the manual.

Veillez lire et respecter toutes les notices d'avertissement et les instructions indiquées sur le produit et incluses dans le manuel.

Laser Safety Instructions

Zhone equipment and associated optical test sets use laser sources that emit light energy into fiber cables. This energy is within the red (visible) and infrared (invisible) regions of the electromagnetic spectrum.

Laser products are subject to federal and state or provincial regulations, and local practices. Regulation 21 CFR 1040 of the U.S. Bureau of Radiological Health requires manufacturers to certify each laser product as Class I, II, III, or IV, depending upon the characteristics of the laser radiation emitted. In terms of health and safety, Class I products present the least hazard (none at all), while Class IV products present the greatest hazard.

Although Zhone optical products have a Class I certification, hazardous exposure to laser radiation can occur when fibers connecting system components are disconnected or broken.

Certain procedures carried out during testing require the handling of optical fibers without dust caps and therefore increase the risk of exposure. Exposure to either visible or invisible laser light can damage your eyes under certain conditions.

Read and observe the following precautions to decrease the risk of exposure to laser radiation.



WARNING! Risk of eye damage. At all times, when handling optical fibers, follow the safety procedures recommended by your company.



WARNING! Avoid direct exposure to fiber ends or optical connector ends. Laser radiation may be present and can damage your eyes.



WARNING! Never look into an active optical fiber or an optical fiber connector opening of an active or powered-up unit.

Note: When working with optical fibers, take these precautions:

- Wear safety glasses when installing optical fibers.
- Clean hands after handling optical fibers. Small pieces of glass are not always visible and can cause eye damage. Get medical assistance immediately for any glass that comes into eye contact.

- Prevent direct exposure to optical fiber ends or optical connector ends where laser signals are directly accessed. Do not handle pieces of optical fiber with fingers. Use tweezers or adhesive tape to lift and discard any loose optical fiber ends.
- Wear rubber gloves to clean optical connectors. The gloves prevent direct contact with the isopropyl alcohol and prevent contamination of the ferrules with skin oils.
- Place all optical fiber clippings in a plastic container provided for that purpose.
- Handle optical fibers with caution. Place the optical fibers in a safe location during installation.
- Follow the manufacturer instructions when using an optical test set. Incorrect calibration or control settings can create hazardous levels of radiation.

Instructions de sécurité relatives au laser

Le matériel de Zhone et les ensembles de tests optiques associés utilisent des sources de laser qui émettent de l'énergie lumineuse dans les câbles optiques. Cette énergie se situe entre les régions rouge (visible) et infrarouge (invisible) du spectre électromagnétique.

Les produits laser sont sujets à des réglementations fédérales et étatiques ou provinciales, ainsi que des pratiques locales. La Réglementation 21 CFR 1040 du U.S. Bureau of Radiological Health oblige les fabricants à certifier chaque produit laser selon les Classes I, II, III, ou IV, en fonction des caractéristiques de la radiation laser émise. En termes de santé et de sécurité, les produits de Classe I présentent le moins de danger (aucun), alors que les produits de Classe IV présentent les plus grands dangers.

Bien que les produits optiques de Zhone disposent d'une certification de Classe I, une exposition dangereuse aux radiations laser peut se produire lorsque les composants du système de connexion des fibres sont déconnectés ou cassés.

Certaines procédures réalisées lors des essais nécessitent la manipulation de fibres optiques sans capuchons antipoussière et augmentent donc le risque d'exposition. L'exposition à la lumière laser visible ou invisible peut endommager vos yeux dans certaines conditions.

Lisez et observez les précautions suivantes pour diminuer le risque d'exposition aux radiations laser.



WARNING! AVERTISSEMENT ! Risque de blessure aux yeux.
Lors de la manipulation de fibres optiques, suivez en permanence les procédures de sécurité recommandées par votre société.



WARNING! AVERTISSEMENT ! Evitez l'exposition directe aux extrémités des fibres ou aux embouts des connecteurs optiques.
Le laser pourrait vous irradier et blesser vos yeux.



WARNING! AVERTISSEMENT ! Ne regardez jamais dans une fibre optique active ou une ouverture de connecteur de fibre optique d'un appareil actif ou sous tension.

Remarque : Lorsque vous travaillez avec des fibres optiques, prenez ces précautions :

- Portez les lunettes de protection lorsque vous installez des fibres optiques.
- Lavez-vous les mains après avoir manipulé des fibres optiques. De petites pièces de verre ne sont pas toujours visibles et peuvent provoquer des affections oculaires. Obtenez une assistance médicale immédiatement pour tout morceau de verre entrant en contact avec les yeux.
- Evitez l'exposition directe aux extrémités des fibres optiques ou aux extrémités des connecteurs optiques où les signaux laser sont directement accessibles. Ne manipulez pas de parties de fibres optiques avec les doigts. Utilisez des pinces typographiques ou du ruban adhésif pour lever et éliminer des extrémités lâches de fibres optiques.
- Portez des gants de caoutchouc pour nettoyer les connecteurs optiques. Les gants protègent du contact direct avec l'alcool isopropylique et évitent la contamination des ferrules avec les huiles de peau.
- Placez toutes les rognures de fibre optique dans un récipient en plastique fourni à cet effet.
- Manipulez les fibres optiques avec précaution. Placez les fibres optiques dans un endroit sûr lors de l'installation.
- Suivez les instructions du fabricant lors de l'utilisation d'un ensemble de test optique. Un étalonnage ou des paramètres de contrôle incorrects peuvent provoquer des niveaux dangereux de radiation.

General Instructions

Other precautions to take before installing or servicing the product are as follows:

- Never install telephone wiring during a lightning storm.
- Never touch uninsulated telephone wires or terminals unless the telephone line has first been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.
- Only authorized service technicians can service this product. Unauthorized service to this product can cause exposure to dangerous high-voltage points or other risks and may result in injury or damage to the unit and void all warranties.
- Special cables, which may be required by the regulatory inspection authority for the installation site, are the responsibility of the buyer.

- When installed in the final configuration, the product must comply with the applicable Safety Standards and regulatory requirements of the country in which it is installed. If necessary, consult with the appropriate regulatory agencies and inspection authorities to ensure compliance.
- Install the zNID in accordance with national and local electric codes in order to meet all applicable requirements. Consult a qualified electrical consultant.

Instructions générales

Les autres précautions à prendre avant l'installation ou l'entretien du produit sont les suivantes :

- N'installez jamais un câblage téléphonique pendant un orage.
- Ne touchez jamais de bornes ou de câbles téléphoniques non isolés à moins que la ligne téléphonique ait été déconnectée depuis l'interface réseau auparavant.
- Soyez prudent lors de l'installation ou de la modification des lignes téléphoniques.
- Seuls les techniciens d'entretien autorisés peuvent entretenir ce produit. L'entretien non autorisé de ce produit peut provoquer une exposition à des points de haute tension dangereux ou à d'autres risques et peut entraîner des blessures ou des dommages à l'appareil et rendre nulles toutes les garanties.
- Les câbles spéciaux, qui peuvent être demandés par l'autorité d'inspection réglementaire pour le site d'installation, sont de la responsabilité du client.
- Lorsqu'il est installé et dans sa configuration finale, le produit doit se conformer aux normes de sécurité et exigences réglementaires applicables du pays dans lequel il est installé. Si nécessaire, consultez les agences réglementaires et autorités d'inspection appropriées afin d'assurer la conformité.
- Installez le zNID conformément aux codes sur l'électricité national et local afin de satisfaire à toutes les exigences applicables. Consultez un conseiller en produits électriques qualifié.

EMI Precautions

Canada

This Class B digital apparatus meets all requirements of the Canadian interference-causing equipment regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du règlement sur le matériel brouilleur du Canada.

1

zNID 24xx SERIES

This chapter describes the 24xx series of zNIDs. It includes the following sections:

- [Overview, page 17](#)
- [zNID 24xx series features, page 21](#)
- [zNID 24xx models, page 22](#)
- [zNID 24xx series specifications, page 24](#)
- [zNID 24xx series dimensions, page 28](#)
- [zNID 24xx series LEDs, page 29](#)
- [Logging in to the 24xx series zNID, page 33](#)

Overview

The zNID 24xx Series (Zhone Network Interface Device) is a family of indoor residential GPON ONTs which are standards based Consumer Premises Equipment (CPE) designed for advanced triple-play deployments. The indoor models in Zhone's zNID product line of ONT's provide a lower cost alternative to outdoor ONT solutions. The small package contains many features including QoS, VoIP, and multicast video support. The zNID ONT is only one component in the PON network. Zhone provides the entire FTTx solution to our customers including the OLT, splitters, cabinets, and the ONT.

The 24xx indoor ONT is designed for high performance applications. Depending on model hardware features include 10/100/1000Mbps LAN Ports and POTS Voice FXS ports, RF video, WiFi and USB in a compact enclosure for indoor use. zNID 24xx Series units may be installed as a desktop or, wall mounted and is powered via an AC Adaptor.

The zNID 24xx Series are ideal for triple-play service deployments in Fiber-to-the-Home application. Industry standard SIP and MGCP voice signaling provides reliable voice services while Zhone's experience with packet voice ensures interoperability and support with a large number of soft switches.

All 24xx series Single Family Unit (SFU) ONTs provide the same voice features found on the 42xx series of outdoor residential ONTs and 9xxx series of outdoor Multiple Dwelling Unit (MDU) ONTs. SIP-PLAR signaling is

supported for connection via Zhone's Voice Gateway to traditional Class 5 TDM switches, while both MGCP and SIP are supported for direct connection to a VoIP Softswitch. This flexibility allows Zhone's 42xx, 9xxx and 24xx Series ONTs to work in nearly all Telco networks, with interoperability support for a broad array of Softswitches.

The Ethernet ports can be separated into different services allowing the configuration of dedicated ports for IP video and data.

Compliant with standard OMCI definition, the zNID-24xx is manageable at the remote site and supports the full range FCAPS functions including supervision, monitoring and maintenance.

Zhone provides THE complete PON solution: ONT, OLT, splitter, EDFA, RF Transmitters, and cabinet solutions are available from Zhone because our customers want to buy a complete and fully tested solution from one trusted source.

The zNID 24xx series may be managed by

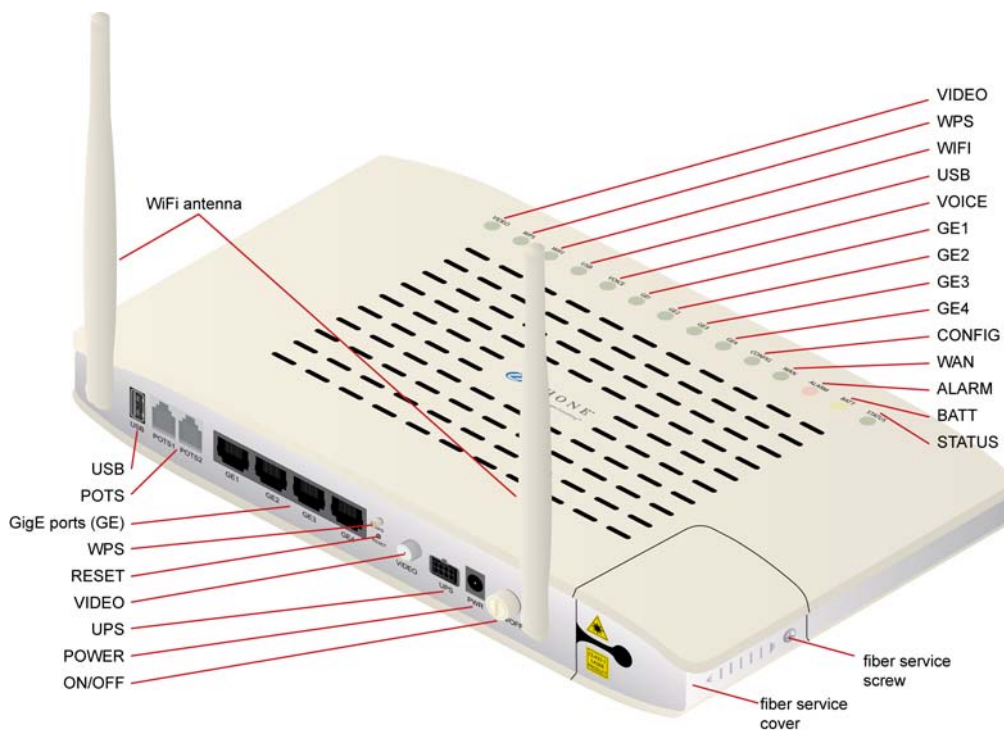
- EZ Touch (Zhone's CPE and zNID management application)
- Zhone Management System (ZMS)
- Web (HTTP)
- Command Line Interface (CLI/Telnet/SSH)
- SNMP

More information about management capabilities see the *zNID Administrator and Operators Guide*.

zNID 24xx series components

The zNID 24xx series indoor ONTs provide a variety of interfaces for triple play deployments. These indoor units may be mounted to a wall or placed on a desktop.

Figure 1: The interfaces, displays and buttons for the zNID 24xx



Depending upon the zNID model selected, the interfaces on the zNID can include:

- Two or four Gigabit Ethernet RJ45 ports
- Two phone ports (POTS)
- WiFi antennae
- RF video
- USB
- Connection for uninterruptable power supply (UPS)

Figure 2: The zNID 24xx series attaches to a fiber tray base

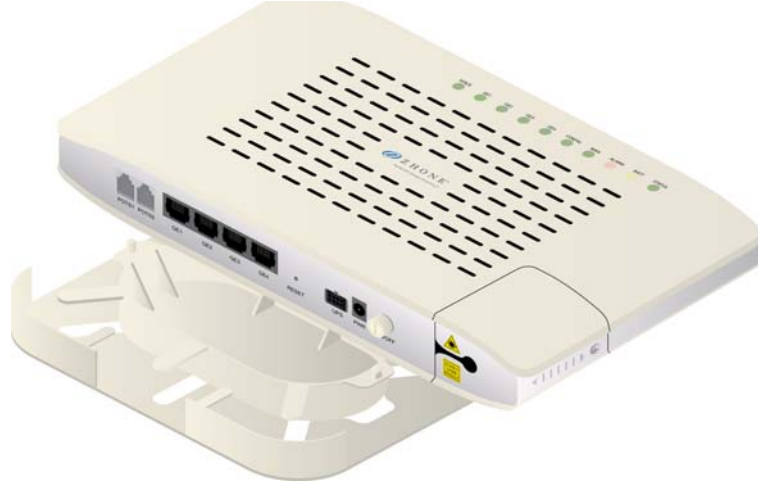


Figure 3: The unit may also be wall mounted, with or without a fiber tray



zNID 24xx series features

Under ideal circumstances, GPON can reach up to 20 or 30 km, however the practical limit is 12 km (about eight miles). Reach is dependent on the configuration of the optical distribution network (ODN).

All 24xx series ONTs are designed for indoor use.

The 24xx series of zNIDs share a common SW architecture with the 42xx and 9xxx series of zNIDs, including the same intuitive Web interface and command line interface. The zNID is also managed by the Zhone Network Management System (ZMS), using SNMP. Software upgrades and configuration backups can be handled automatically by the ZMS using the EZ Touch management feature.

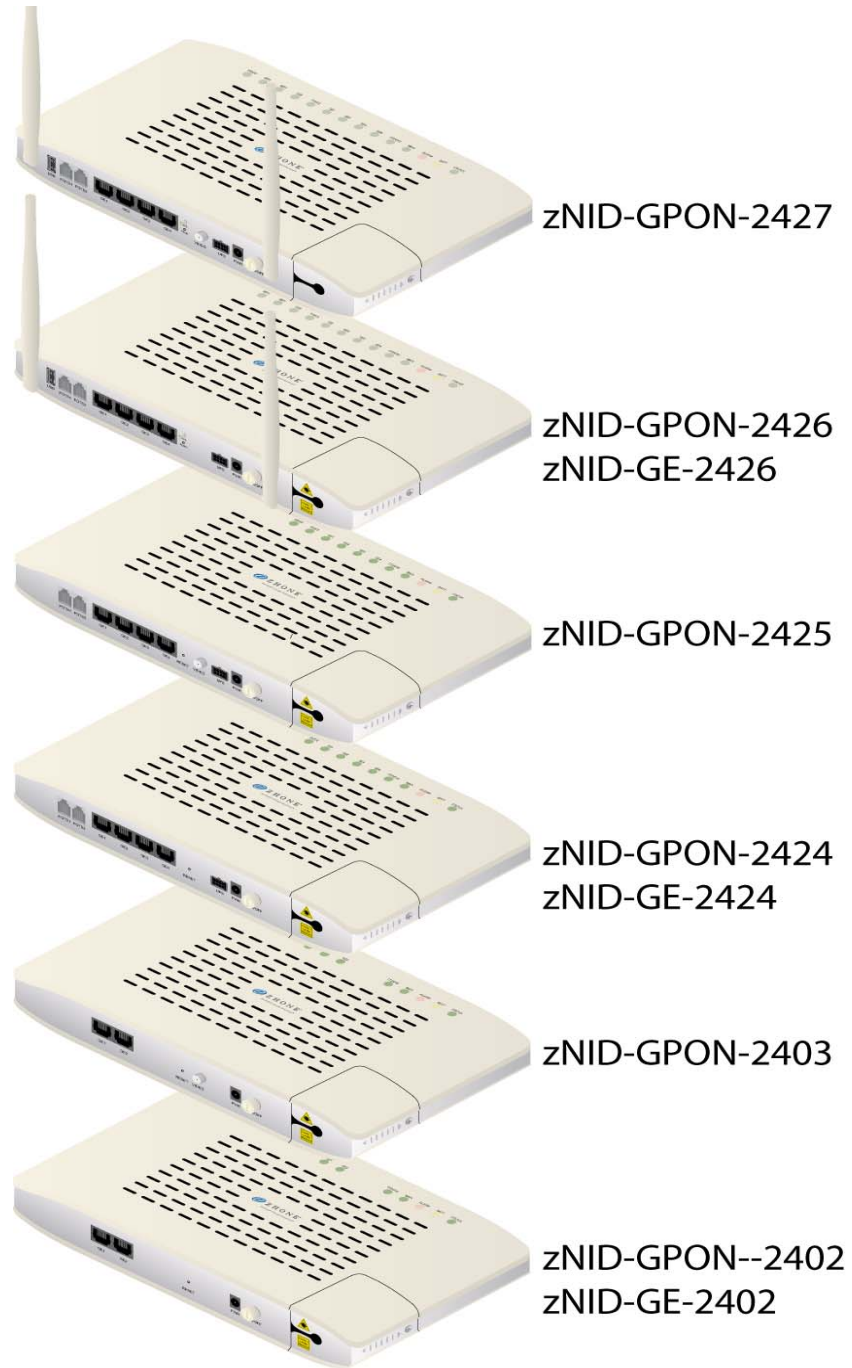
This section covers:

- [zNID 24xx models](#)
- [zNID 24xx series specifications](#)
- [zNID 24xx series dimensions](#)

The zNID enables service providers to provide voice, data, and video services along with advanced IP and data support.

zNID 24xx models

Figure 4: zNID 24xx models



Caution: To ensure adequate ventilation, nothing should be placed on the top of the zNID 24xx. zNID 24xx units should not be stacked.

Précaution : Pour assurer une ventilation adéquate, rien ne doit être placé au-dessus des appareils zNID 24xx. Les unités zNID 24xx ne doivent pas être empilées.

GPON models

The zNID series GPON models have the following interfaces:

Model	Description
zNID-GPON-2402	GPON Uplink, 2 GigE
zNID-GPON-2403	GPON Uplink, 2 GigE, RFV
zNID-GPON-2424	GPON Uplink, 2 POTS, 4 GigE
zNID-GPON-2425	GPON Uplink, 2 POTS, 4 GigE, RFV
zNID-GPON-2426	GPON Uplink, 2 POTS, 4 GigE, WiFi, USB
zNID-GPON-2427	GPON Uplink, 2 POTS, 4 GigE, WiFi, RFV, USB

Gigabit Ethernet models

The zNID series Gigabit Ethernet models have the following interfaces:

Model	Description
zNID-GE-2402	GE Uplink, 2 GigE
zNID-GE-2424	GE Uplink, 2 POTS, 4 GigE
zNID-GE-2426	GE Uplink, 2 POTS, 4 GigE, WiFi, USB

zNID 24xx series specifications

The possible interfaces and number of interfaces depend on the specific model, see [zNID 24xx models on page 22](#) for a list of models and their interfaces.

Table 2: zNID 24xx common specifications

Specifications	Values
Dimensions:	1.18 in (30 mm) high x 10.04 in (255 mm) wide x 5.91 in (150 mm) deep height does not include feet
Weight:	500 g (1.1 lb.)
Operating temperature:	0 ⁰ C to +40 ⁰ C (32 ⁰ F to +104F)
Storage temperature	-20 ⁰ C to +85 ⁰ C (-4 ⁰ F to +185F)
Power	Input: 12Vdc 1.5A Adapter: 100-240V~ 50/60 Hz Max 0.7A Power Consumption: 8-12W Dying Gasp Support
Interfaces	<p>Uplinks:</p> <ul style="list-style-type: none"> • GPON: SC/APC connector <ul style="list-style-type: none"> – 1.244Gbps Burst Mode Upstream Transmitter (1310nm) – 2.488Gbps Downstream Receiver (1490nm) – Downstream Video Receiver (1550nm) for ZNID-GPON-2403, 2425, 2427 only • GE: SC/UPC connector for ZNID-GE-24xx <ul style="list-style-type: none"> – 1.244Gbps Upstream Transmitter (1310nm) – 1.244Gbps Downstream Receiver (1490nm) <p>Customer facing interfaces (Depends on model):</p> <ul style="list-style-type: none"> • POTS interfaces (RJ11) • Gig E interfaces (RJ45 - 10/100/1000Base-T Ethernet) <p>Host port interface:</p> <ul style="list-style-type: none"> • USB craft port (standard type A USB connector) zNID 2426 and 2427 only <p>Wi-Fi interface:</p> <ul style="list-style-type: none"> • Dual 802.11b/g/n (zNID 2426 and 2427) <p>Coaxial interface:</p> <ul style="list-style-type: none"> • RF video overlay zNID 2403, 2425 and 2427 only (47–870MHz)
Standards Support	<ul style="list-style-type: none"> • ITU-T G.984 compliant

Table 2: zNID 24xx common specifications (Continued)

Specifications	Values
Protocol Support	<ul style="list-style-type: none"> • GPON uplink <ul style="list-style-type: none"> – ITU-T G.984 (GPON) – Multiple T-CONTS per device – Multiple GEM Ports per device – 1:1 mapping of GEM ports into T-CONTS with priority queue based scheduling – Activation with automatic discovered SN and password in conformance with ITU-T G.984.3 – AES-128 Decryption with key generation and switching – FEC (Forward Error Correction) – 802.1p mapper service profile on U/S – Mapping of GEM Ports into a T-CONT with priority queues based scheduling – Support for Multicast GEM Port • Ethernet/IP <ul style="list-style-type: none"> – Bridging and switching (802.1D / 802.1 Q) – Eight traffic classes with 802.1p – 802.3_x flow control – MAC address entries <ul style="list-style-type: none"> For OMCI-configured traffic flows, no limit (no bridge table) For Bridged VLANs, configured via Web UI or CLI in RG Mode, 4096 bridge table entries are supported. (only the most recent 100 entries are displayed). – VLAN tagging / untagging – VLAN stacking (Q-in-Q) – MAC limiting – 802.1x Ethernet Authentication – PPPoE client • DHCP server, DHCP client • FTP, TFTP • Telnet • HTTP • SSH • SNMP • NAT • QoS <ul style="list-style-type: none"> – 802.1P/Q prioritization – ToS IP Precedence – Traffic shaping – bandwidth management and rate limiting • Firewall and Security

Table 2: zNID 24xx common specifications (Continued)

Specifications	Values
POTS (Voice) Support	<ul style="list-style-type: none"> • SIP (RFC 3261) • SIP-PLAR • MGCP • 5 REN per line, balanced Ring at 60V RMS, DTMF dialing • Multiple voice codec: G.711 (u/a-law), G.726, G.729 (A and B) • Echo Canceling, Voice Activity Detection (VAD), Comfort Noise Insertion (CNI) • Various CLASS services — Caller ID, Call Waiting, Call Forwarding, Call Transfer, etc. • T.30 and T.38 Fax • G.711 fallback for FAX • Pulse metering
Wireless (WiFi) Support	<ul style="list-style-type: none"> • 2x2 MIMO • Antenna: 5dBi • 25dBm EIRP (316mW) Maximum Tx Power • max number of subscribers: 16 per SSID • SSID support: 4 • 1:1 mapping of SSIDs to VLANs • WEP, WPA-PSK, WPA2-PSK (AES, TKIP) • 802.1x • 64 bit and 128 bit WEP support • MAC address filtering • DDNS
IPTV	<ul style="list-style-type: none"> • IGMP multicast • IGMP snooping
Management	<ul style="list-style-type: none"> • Zhone Management System <ul style="list-style-type: none"> – EZ Touch – CPE Manager • OMCI • Web UI • Command Line Interface • SNMP

Table 2: zNID 24xx common specifications (Continued)

Specifications	Values
Regulatory Compliance	<ul style="list-style-type: none"><li data-bbox="542 296 623 321">• CE<li data-bbox="542 342 623 367">• UL<li data-bbox="542 388 716 413">• FCC Part B

zNID 24xx series dimensions

Figure 5: zNID 24xx dimensions

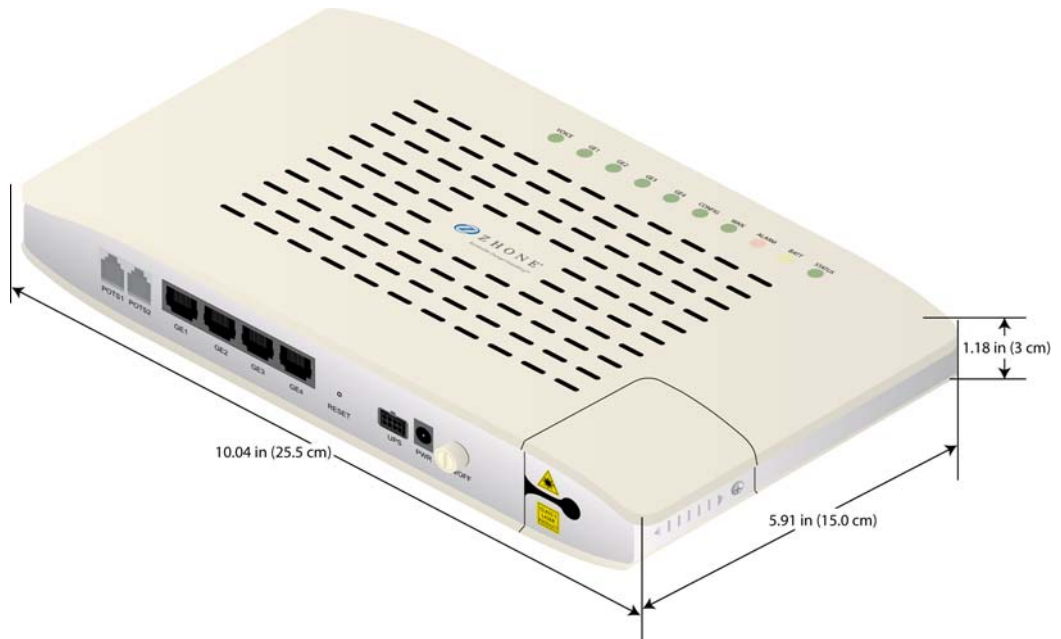
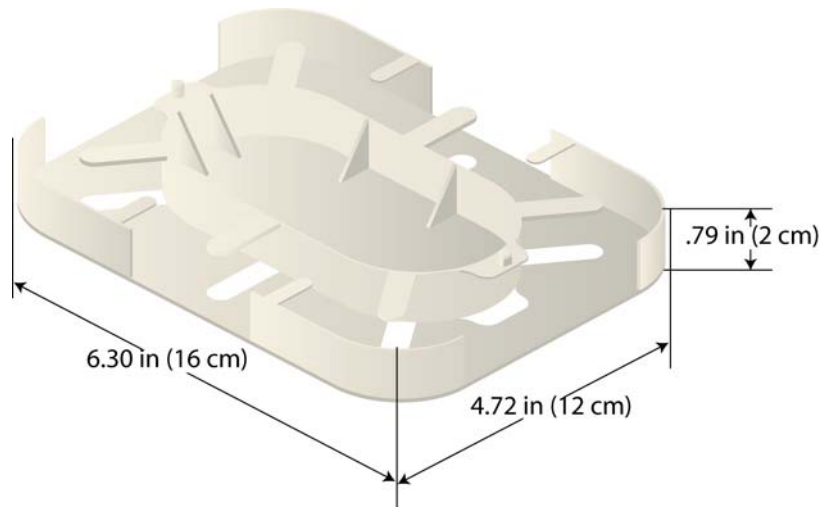


Figure 6: zNID fiber tray dimensions



zNID 24xx series LEDs

The LEDs vary depending on the model of zNID. See [zNID 24xx models on page 22](#) for a complete list of zNID models.

GPON

Figure 7: zNID-GPON-24xx LEDs

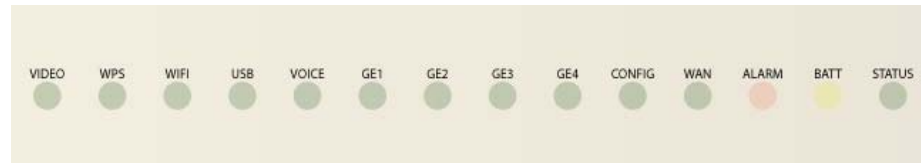


Table 3: zNID-GPON-24xx LEDs

LED Name	Color	Indicates
STATUS	Green: Heartbeat (1 short blink every 5 seconds)	Normal Operation
	Green: Rapid blink (10/sec)	Unit has been reset to Factory Defaults / is unconfigured
	Green: Alternating fast blinking and Off (1 second rapid blink/1 second off)	EZ Touch communications in process
	Green: Slow blink (1/second)	Remote Mgt Access (OMCI, SNMP, HTTP, Telnet, or TR-069)
	Green: On	Reboot or restart in process
	Off	Power off
BATT	Yellow: On	Operating on Battery Power
	Yellow: Slow blink (1/sec)	Battery Alarm (Low Battery, Missing, or Replace)
	Off	Normal operation on AC power
ALARM	Red: On	Running on battery
	Red: 50% cycle: 1 sec Rapid Blink/ 1 sec Off	EZ Touch actions pending -- SW or Config update required
	Off	Normal operation on AC power

Table 3: zNID-GPON-24xx LEDs

LED Name	Color	Indicates
WAN	Green: On	Ranged successfully
	Green: Slow blink (1/sec)	Ranging in progress
	Off	Not ready for ranging or not provisioned
CONFIG	Green: On	OMCI provisioning is complete
	Green: Rapid blink (10/sec)	OMCI provisioning is written to FLASH
	Green: Slow blink (1/sec)	OMCI provisioning is in progress
	Off	No OMCI provisioning
GE1 – GE4	Green: On	Ethernet interface link
	Green: Flash	Data transmitting
	Off	No link on Ethernet interface
VOICE	Green: On	Registered successfully
	Green: Slow blink (1/sec)	Off hook
	Off	Registration failed or telephone service is not provisioned
USB	Green: On	Connected
	Off	No power/USB not connected
WIFI	Green: On	WIFI enabled
	Green: Flash	Data transmitting
	Off	WIFI disabled
WPS	Green: Long flash	Success
	Green: Flash	In progress
	Off	WPS disabled
VIDEO	Green: On	1550nm signal is normal and RF video output is enabled
	Green: Slow blink (1/sec)	RF video output is enabled, but no 1550nm signal received
	Off	RF video output is disabled

GE

Figure 8: zNID-GE-24xx LEDs

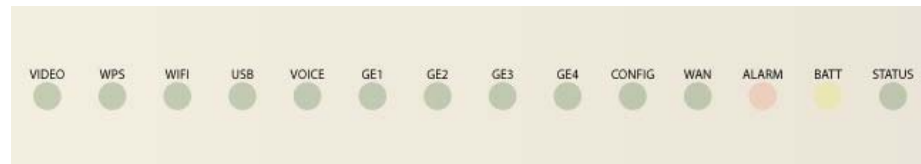


Table 4: zNID-GE-24xx LEDs

LED Name	Color	Indicates
STATUS	Green: Heartbeat (1 short blink every 5 seconds)	Normal Operation
	Green: Rapid blink (10/sec)	Unit has been reset to Factory Defaults / is unconfigured
	Green: Alternating fast blinking and Off (1 second rapid blink/1 second off)	EZ Touch communications in process
	Green: Slow blink (1/second)	Remote Mgt Access (OMCI, SNMP, HTTP, Telnet, or TR-069)
	Green: On	Reboot or restart in process
	Off	Power off
BATT	Yellow: On	Operating on Battery Power
	Yellow: Slow blink (1/sec)	Battery Alarm (Low Battery, Missing, or Replace)
	Off	Normal operation on AC power
ALARM	Red: On	Running on battery
	Red: 50% cycle: 1 sec Rapid Blink/ 1 sec Off	EZ Touch actions pending -- SW or Config update required
	Off	Normal operation on AC power
WAN	Green: On	Ranged successfully
	Green: Slow blink (1/sec)	Ranging in progress
	Off	Not ready for ranging or not provisioned

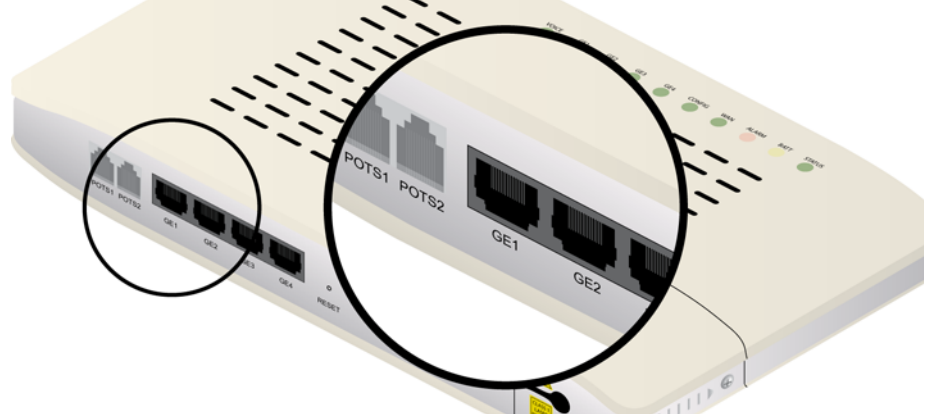
Table 4: zNID-GE-24xx LEDs

LED Name	Color	Indicates
CONFIG	Green: On	OMCI provisioning is complete
	Green: Rapid blink (10/sec)	OMCI provisioning is written to FLASH
	Green: Slow blink (1/sec)	OMCI provisioning is in progress
	Off	No OMCI provisioning
GE1 – GE4	Green: On	Ethernet interface link
	Green: Flash	Data transmitting
	Off	No link on Ethernet interface
VOICE	Green: On	Registered successfully
	Green: Slow blink (1/sec)	Off hook
	Off	Registration failed or telephone service is not provisioned
USB	Green: On	Connected
	Off	No power/USB not connected
WIFI	Green: On	WIFI enabled
	Green: Flash	Data transmitting
	Off	WIFI disabled
WPS	Green: Long flash	Success
	Green: Flash	In progress
	Off	WPS disabled
VIDEO	Green: On	1550nm signal is normal and RF video output is enabled
	Green: Slow blink (1/sec)	RF video output is enabled, but no 1550nm signal received
	Off	RF video output is disabled

Logging in to the 24xx series zNID

The zNID 24xx series may be managed from OMCI, Web UI or CLI. This section describes logging into the zNID locally using the subscriber facing LAN port, GE1.

Figure 9: Log into GE port 1 to reach the Web UI or CLI on the zNID



To login with a browser:

- 1 Connect an Ethernet cable from your computer to GE1 on the zNID.
- 2 Launch a browser and point it to 192.168.1.1.
- 3 Enter the username and password.

The default username/password is admin/zhone.

To login with a telnet session:

- 1 Connect an Ethernet cable from your computer to GE1 on the zNID.
- 2 Launch a telnet session and point it to 192.168.1.1.
- 3 Enter the username and password.

The default username/password is admin/zhone.

2

zNID 24xx INSTALLATION

This chapter can be used as separate installation instructions. This chapter explains how to unpack the zNID 24xx and install the zNID 24xx hardware. It includes the following sections:

- [Install the zNID, page 35](#)
- [Overview of zNID 24xx series installation, page 36](#)

Install the zNID

This section describes the procedures for installing the zNID. The overview procedure provides options for wall mounting or placing the zNID on a surface with or without the optional fiber tray.

This section contains the following topics:

- [Overview of zNID 24xx series installation on page 36](#)
- [Installation precautions on page 37](#)
- [Mount the zNID on page 38](#)
 - [Wall mount with fiber tray on page 38](#)
 - [Wall mount without fiber tray on page 41](#)
 - [Desktop with fiber tray on page 43](#)
- [Manage the optical cable on page 44](#)
- [Fiber handling on page 44](#)
- [Testing optical power on page 44](#)
- [Optical fiber cable placement in the zNID fiber tray on page 45](#)
- [Connect to network on page 46](#)
- [Connect power on page 48](#)
- [Connecting phone terminals on page 49](#)
- [Connecting Ethernet ports on page 50](#)
- [Complete the zNID installation on page 52](#)

Overview of zNID 24xx series installation

1 Select the location

Ensure that the environment is free of dust and excessive moisture and has sufficient ventilation.

The zNID may be installed in a vertical or horizontal orientation (wall or desktop). The zNID should be placed in a clean dry place as is appropriate for electronic equipment

Installation precautions on page 37

Install the system in reasonable proximity to all equipment or rooms where the TV or computer reside for straightforward connections.

2 Mount the zNID.

Mount the zNID on page 38

3 Install service fiber to the zNID.

Connect to network on page 46

4 Connect AC power and/or UPS

Connect power on page 48

5 Connect the subscriber facing services

a Connect telephone (POTS) service

See *Connecting POTS on page 49*.

b Connect Ethernet service

See *Connect Ethernet ports on page 50*.

c Connect Ethernet service

See *Connect coaxial port on page 51*.

6 Complete

Checking the LEDs on page 52

Installation precautions

Maximum operating temperature should not exceed the range of 0° C to 40° C (32° F to 104° F).

Ensure that proper cable grades are used for all system and network connections. For best results, use the cables and connectors recommended in this document.

Connect the system to the power supply circuit as described in this document.

Before making fiber connections, be sure that the optical cable fiber tips and components are clean and free of dust and debris. Follow established cleaning procedures if required.



Note: Sharp bends in fiber cables create undesirable optical attenuation or loss. The zNID fiber tray provides fiber spools and hooks to avoid sharp bends in the fiber cable. A minimum bend radius of 30 mm (1.2 in) is recommended for stripped fiber.

La température maximum de fonctionnement ne doit pas dépasser le plage de 0° C à 40° C (32° F à 104° F).

Assurez-vous que les rangs de câbles corrects sont utilisés pour tous les raccordements du système et du réseau. Pour les meilleurs résultats, utilisez les câbles et connecteurs recommandés dans ce document.

Raccordez le système au circuit d'alimentation comme décrit dans ce document.

Avant de réaliser les raccordements des fibres, soyez sûr que les embouts de fibre des câbles optiques et les composants sont propres et libres de poussière et autres débris. Suivez les procédures de nettoyage établies si nécessaire.



Note: Remarque : Les courbes serrées dans les câbles optiques créent une atténuation ou une perte optique indésirable. Le plateau de fibres zNID fournit des bobines et des crochets de fibre afin d'éviter les courbes serrées dans le câble optique. Un rayon de courbure minimum de 30 mm (1,2 po) est recommandé pour la fibre dénudée.

Mount the zNID

The zNID enclosure can be mounted on a vertical surface or a horizontal surface (wall or desktop).

- [Wall mount with fiber tray on page 38](#)
- [Wall mount without fiber tray on page 41](#)
- [Desktop with fiber tray on page 43](#)

Wall mount with fiber tray

The zNID fiber tray can be mounted on a wall using four screws.



Caution: To prevent damage to the enclosure, use screws appropriate to the mounting surface.

Précaution : Afin d'éviter d'endommager l'enceinte, utilisez des vis adaptées à la surface de montage.



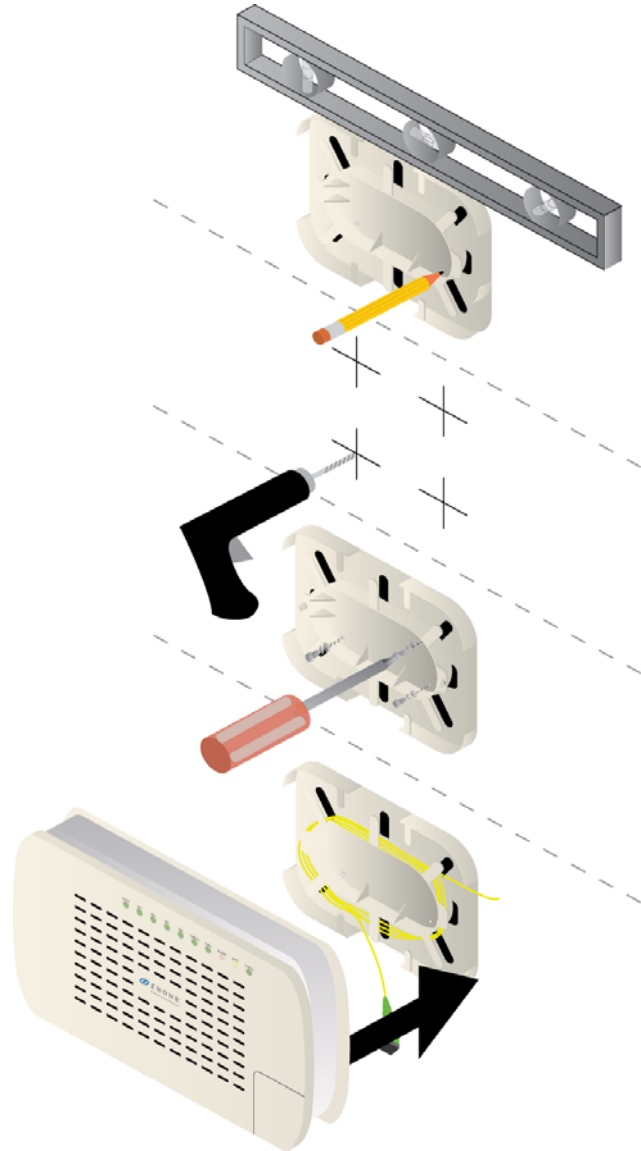
Caution: Install the zNID fiber tray a proper height from the floor.

Précaution : Installez le plateau de fibres zNID à une hauteur correcte par rapport au sol.

Mounting the zNID fiber tray on a wall

To mount the zNID fiber tray on a wall:

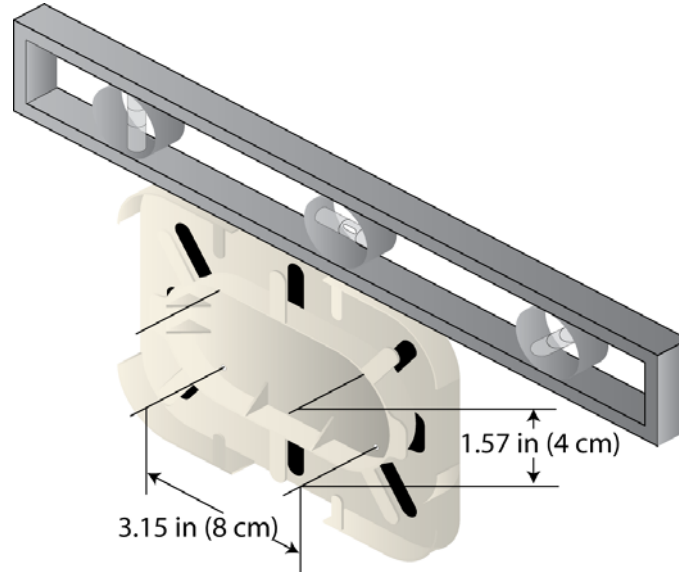
Figure 10: Installing the fiber tray on a wall



- 1 Prepare the surface for mounting.

- 2 Hold the bracket level in the desired location and mark the hole positions.

The holes for the fiber tray are 8 cm apart (about 3.15 inches or a little less than 3 and 3/16 inches) on the horizontal axis and 4 cm apart (about 1.57 inches or about 1 and 9/16 inches) on the vertical axis.



- 3 Drill the holes.
- 4 Line up the fiber tray with the screw holes and attach the screws.
Use attaching hardware appropriate for the type of surface to which the unit is mounted (i.e. wood, brick, CB, etc.).
Use shims when necessary to keep the zNID vertical.
- 5 Wind the fiber in the tray.
See [Optical fiber cable placement in the zNID fiber tray on page 45](#)
- 6 Put the zNID on the fiber tray.
The wall mount sockets on the zNID fit the two nubs which stick out from the fiber spool on the fiber tray.

Wall mount without fiber tray



Caution: To prevent damage to the enclosure, use screws appropriate to the mounting surface.

Précaution : Afin d'éviter d'endommager l'enceinte, utilisez des vis adaptées à la surface de montage.



Caution: Install the zNID fiber tray a proper height from the floor.

Précaution : Installez le plateau de fibres zNID à une hauteur correcte par rapport au sol.

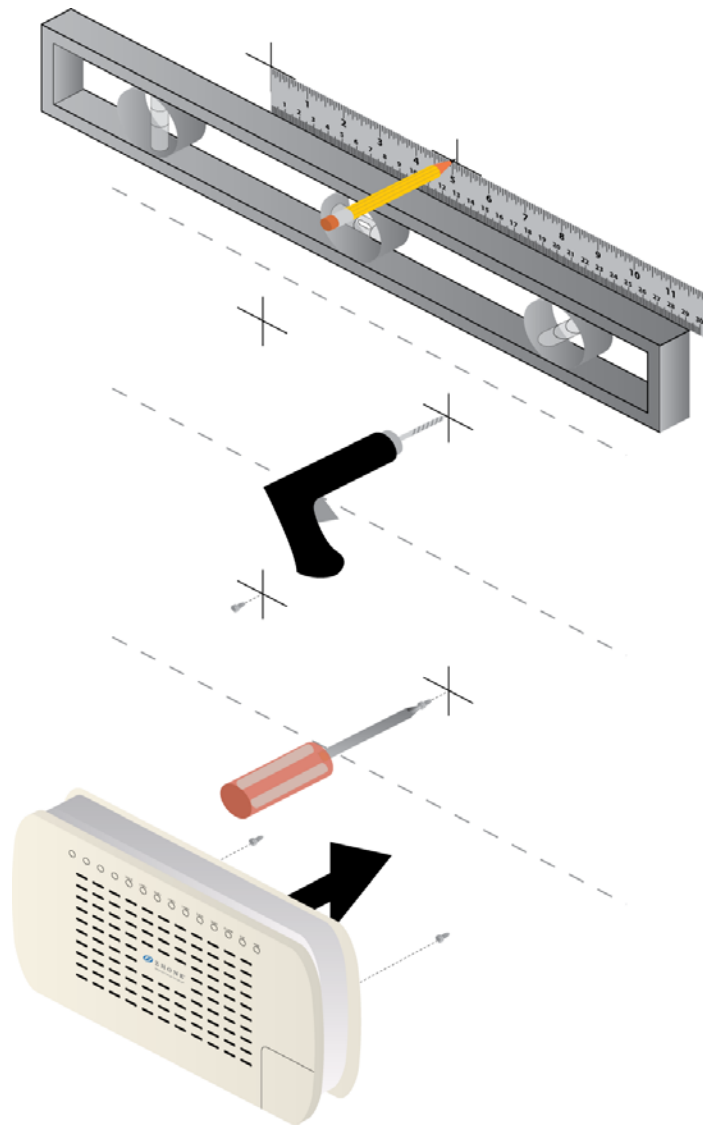


Caution: The zNID should always be mounted in a vertical orientation.

Précaution : Le zNID doit toujours être monté en orientation verticale.

Mounting the zNID on a wall without the fiber tray

Figure 11: Installing the fiber tray on a wall

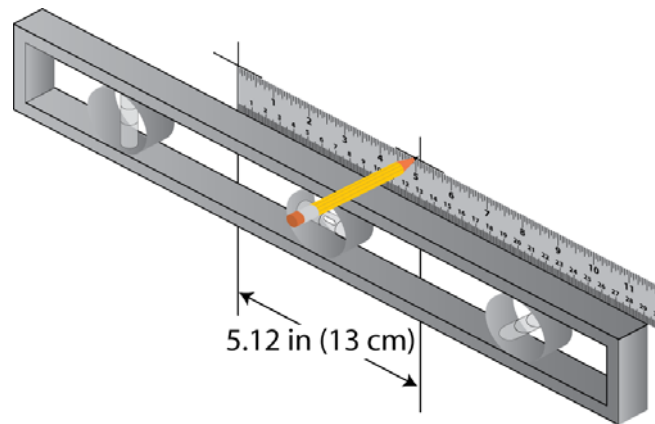


To mount the zNID directly on a wall:

- 1 Prepare the surface for mounting.

2 Mark the hole positions.

The holes for the fiber tray are 13 cm apart (about 5.12 inches or a little less than 5 and 1/8 inches) on the horizontal axis.



3 Drill the holes.

4 Attach the screws.

Use screws appropriate for the type of surface to which the unit is mounted (i.e. wood, brick, CB, etc.).

5 Put the zNID on the screws.

The screws should be leave enough space from being flush with the wall for the zNID legs to hold the unit firmly against the wall.

Desktop with fiber tray

To mount the zNID fiber tray on a wall:

1 Prepare the surface for mounting.

2 Wind the fiber in the tray.

See [Optical fiber cable placement in the zNID fiber tray on page 45](#)

3 Put the zNID on the fiber tray.

The wall mount sockets on the zNID fit the two nubs which stick out from the fiber spool on the fiber tray.

Manage the optical cable

When making a fiber optic connection, avoid touching the fiber cable ends to the outside of the mating connector. Touching can contaminate the connectors.

Fiber handling

Before making any connections, be sure that the optical cable fiber tips and components are clean and free of dust and debris.

The zNID fiber tray provides fiber spools and hooks to avoid sharp bends in the fiber cable. A minimum bend radius of 30 mm is recommended for stripped fiber and larger fiber needs a larger bend radius to guarantee the specified system performance.



Note: Sharp bends in fiber cables create undesirable optical attenuation or loss.

Testing optical power

Table 5 specifies how much laser power to expect on the fiber.

Table 5: Optical values for the triplexer for zNID-GPON-24xx


Parameter	1490 nm (Data Downstream)	1550 nm (RF Downstream)
Damage Level	+5 dBm	+5 dBm
Optical Overload	-8 dBm	+2 dBm
Minimal Optical Signal	-28 dBm	-8 dBm
Mid Range Optical Value	-17 dBm	-4 dBm

Table 6: Optical values for the triplexer for zNID-GE-24xx

Parameter	Active Ethernet
Damage Level	+5 dBm
Optical Overload	-2 dBm
Minimal Optical Signal	-23 dBm
Mid Range Optical Value	-12 dBm

Optical fiber cable placement in the zNID fiber tray

Using a fiber tray involves routing the optical fiber around the spools, then physically to the SC connector in the zNID.

-
-  **Note:** Sharp bends in fiber cables create undesirable optical attenuation or loss. The zNID enclosure provides fiber spools and hooks to avoid sharp bends in the fiber cable. A minimum bend radius of 30 mm (1.2 in) is recommended for stripped fiber.
-


To place the fiber cable in the fiber tray:

- 1 Inspect and clean the fiber connector to ensure it is free of impurities.
- 2 Make sure the fiber segment is properly installed in the fiber tray, excess cable is wrapped around fiber reels without having improper bends leaving enough loose cable so that it will not take too sharp of a bend to connect to the zNID.

Figure 12: Maintain the proper bend radius in the fiber



- 3 Test the fiber cable to verify clean signals.

-
-  **Note:** It is recommended that the fiber cable be tested before finishing.
-

Connect to network

Connecting the SC connectors

Connect the SC connector from the electronics module to the SC connector in the zNID enclosure.

Observe the necessary precautions to decrease the risk of exposure to laser radiation.



WARNING! Risk of eye damage. At all times when handling optical fibers, follow the safety procedures recommended by your company.

AVERTISSEMENT ! Risque de blessure aux yeux. Lors de la manipulation de fibres optiques, suivez en permanence les procédures de sécurité recommandées par votre société.

Although Zhone optical products have a Class I certification, hazardous exposure to laser radiation can occur when fibers are connected, disconnected or broken. Handling of optical fibers without dust caps increases the risk of exposure. Exposure to either visible or invisible laser light can damage your eyes under certain conditions.

- 1 Remove the fiber service cover by removing the fiber service screw and then sliding the fiber service cover forward (toward the connection panel of the zNID).

Using your thumb push on the raised marking on the fiber service cover to slide it off.

For a new unit the fiber service cover will be in a bag, so you will not need to do this step.

Figure 13: zNID-GPON-24xx model uses SC/APC connector (green)

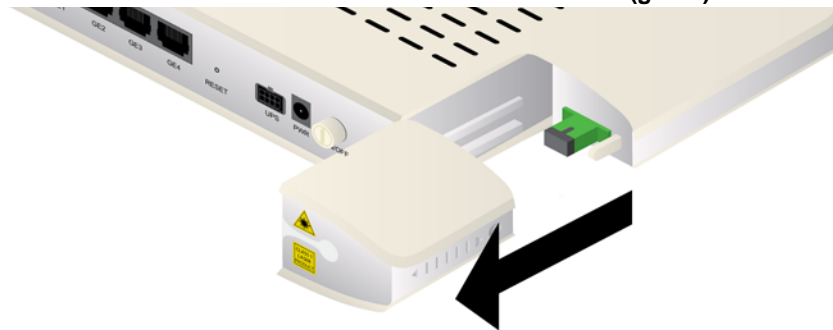
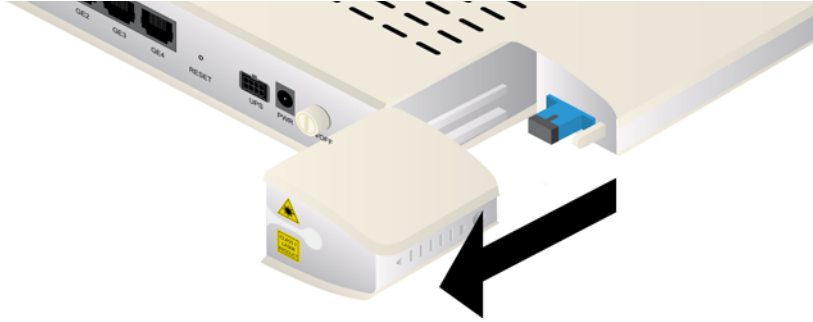


Figure 14: zNID-GE-24xx model uses SC/UPC connector (blue)

- 2 Remove the dust covers from the SC optical connectors.
Clean the connector if necessary.
- 3 Plug in the fiber connector to connect the zNID to the network.



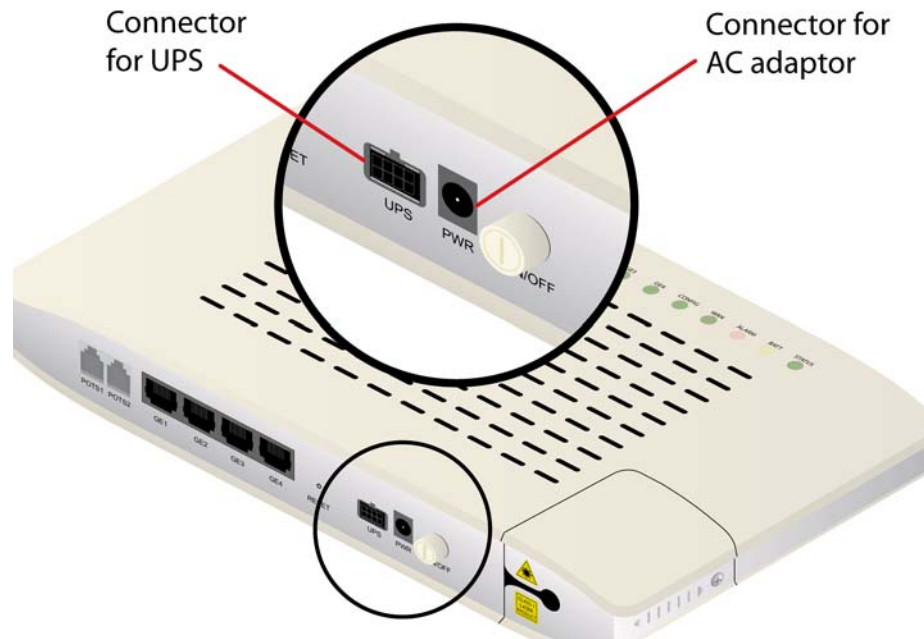
Note: To function properly the optical strength to the zNID should be between -8dBm and -27dBm for GPON and between -2dBm and -23dBm for GE units. See [Testing optical power on page 44](#) for information.

- 4 Reattach the fiber service cover onto the zNID including the fiber service screw.

Connect power

The zNID is powered by AC power using the adapter which is shipped with the unit. An optional uninterruptable power supply may also be used.

Figure 15: The zNID 24xx has both AC input and UPS input for power



 **Note:** The AC input and UPS input must not be used at the same time.

For pinout information for the UPS connector, see [UPS pinouts on page 55](#).

Connecting phone terminals

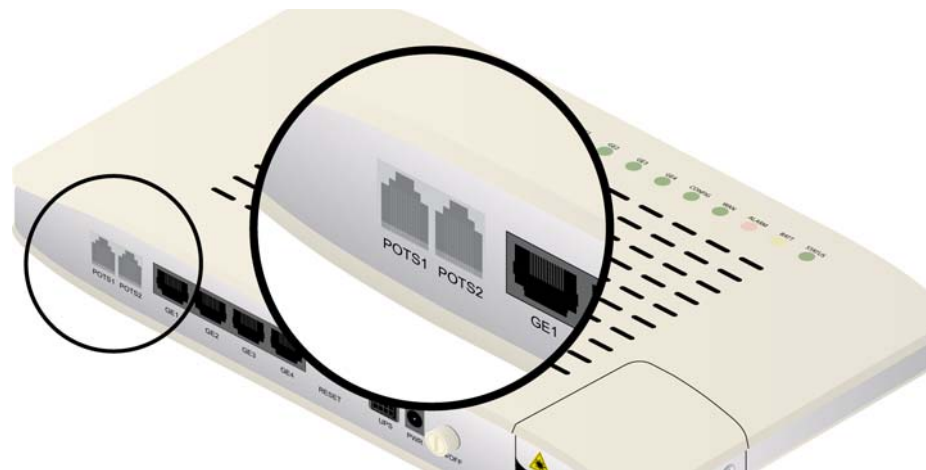
The zNID 24xx models have the ability to connect POTS via RJ-11.

Connecting POTS

The zNID 24xx models have the ability to connect POTS via RJ-11 connector. The terminal connections are shown in [Figure 16](#).

- 1 Locate the subscriber's telephone wire pair.

Figure 16: Connect phone lines



- 2 If the wire pair is not terminated, follow local practices to attach an RJ-11 connector.
- 3 Plug the wire pair with RJ-11 connector into one of the zNID RJ-11 phone jacks.
- 4 Repeat steps 1-3 as needed to connect additional phone lines.

For pinout information for the POTS connector, see [POTS pinouts on page 54](#).

Connecting Ethernet ports

The zNID-24xx series models have up to 4 Gigabit Ethernet ports.

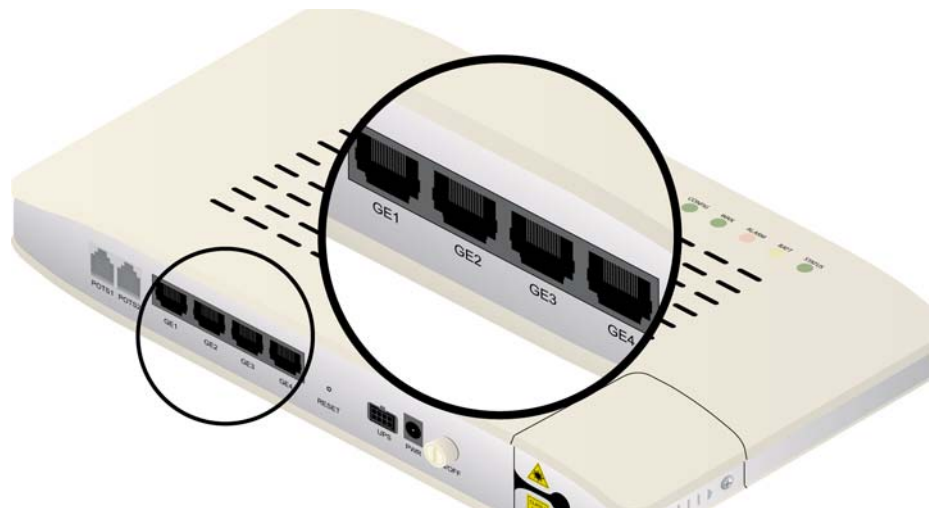
Connect Ethernet ports

The zNID provides RJ eight pin modular jacks (RJ45) for Ethernet connections. Ethernet connections can be used to deliver any packet services including IPTV, data, and VoIP.

For Ethernet services, connect a Category 5 or a Category 6 cable to an RJ45 interface as shown in [Figure 17](#).

- 1 Locate the Ethernet LAN cable.
- 2 If the cable is not terminated, follow local practices to attach an RJ-45 connector.
- 3 Plug the Ethernet cable into the appropriate RJ-45 Ethernet port.

Figure 17: The RJ-45 Ethernet ports.



- 4 Repeat steps 1-3 as needed to connect additional Ethernet cables. For pinout information for the Gigabit Ethernet connector, see [Gigabit Ethernet pinouts on page 53](#).

Connecting coaxial port

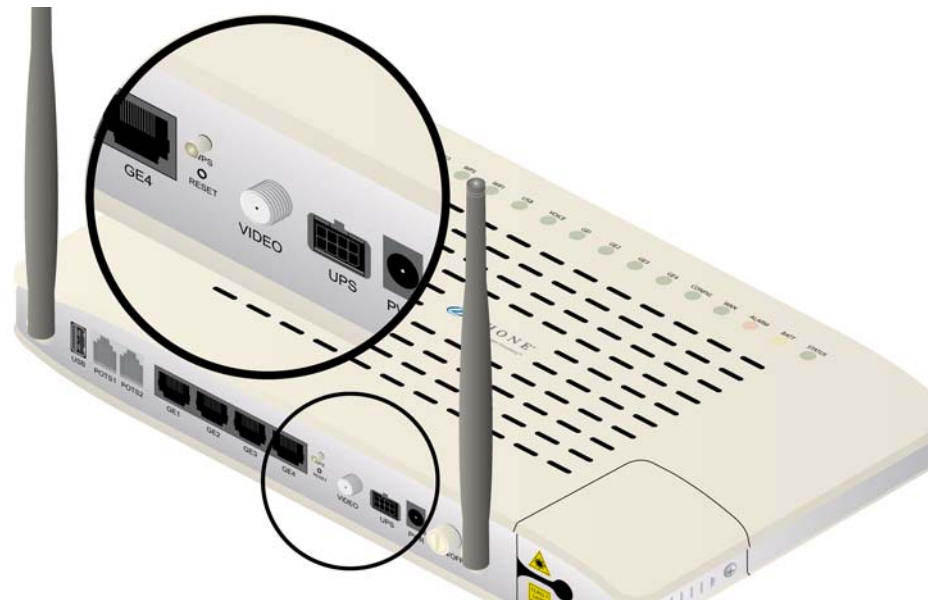
The zNID-24xx series models have a coaxial port for RF video. The RF signal is 46 MHz to 870 MHz

Connect coaxial port

The zNID provides a coaxial port for RF Video.

- 1 Locate the coaxial cable.
- 2 Screw the coaxial connector into the coaxial connector.

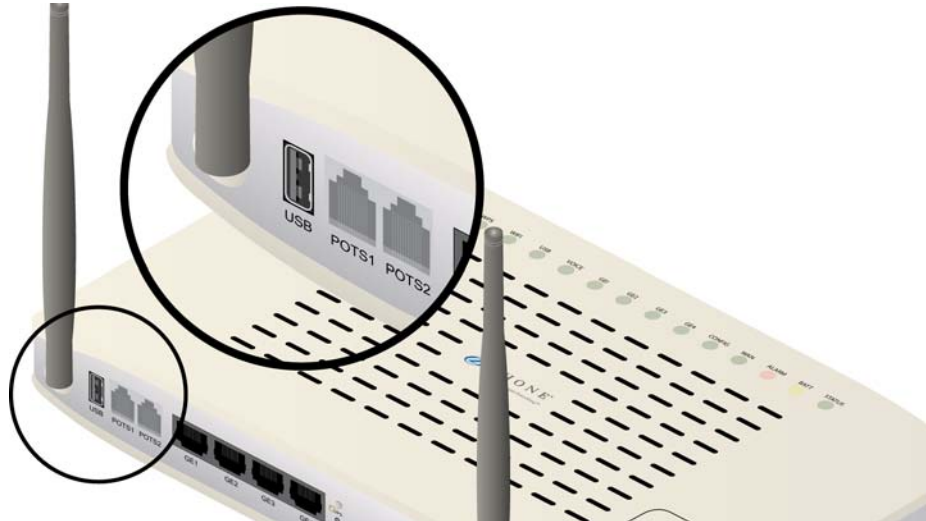
Figure 18: The coaxial port.



Connecting USB port

The zNID-24xx series models have a USB 2.0 port for future applications.

Figure 19: The USB port.



Complete the zNID installation

After making the physical connections, complete the installation by checking the LEDs, the grounding for the full enclosure, closing the outer cover, sealing the entry holes, and screwing in the final screw to secure the unit.

Checking the LEDs

Check the LEDs to verify that power is working.



See the [zNID 24xx series LEDs](#) on page 29.

A

APPENDIX: PINOUTS

This appendix provides the following pinouts

- [Gigabit Ethernet pinouts on page 53](#)
- [POTS pinouts on page 54](#)
- [UPS pinouts on page 55](#)

Gigabit Ethernet pinouts

Figure 20: The Gigabit Ethernet ports use an RJ45 connector

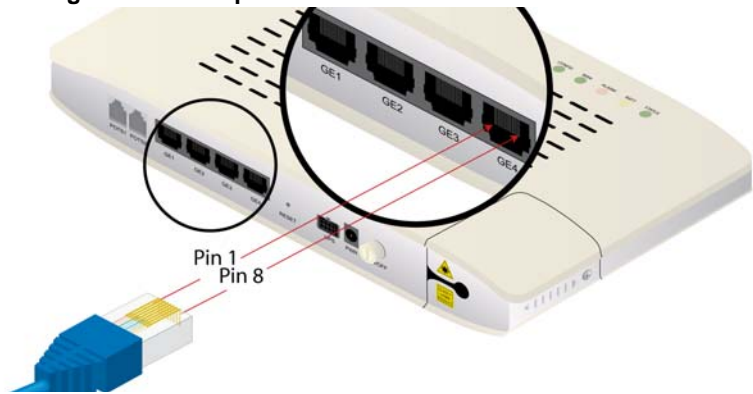


Table 7: Pinout for the GigE RJ45

Pin	Name	Description
1	TX_D1+	Transceive data +
2	TX_D1-	Transceive data -
3	RX_D2+	Recieve data +
4	BI_D3+	Bi-directional data +
5	BI_D3-	Bi-directional data -
6	RX_D2-	Receive data -
7	BI_D4+	Bi-directional data +
8	BI_D4-	Bi-directional data -

POTS pinouts

Figure 21: The POTS ports use an RJ11 connector

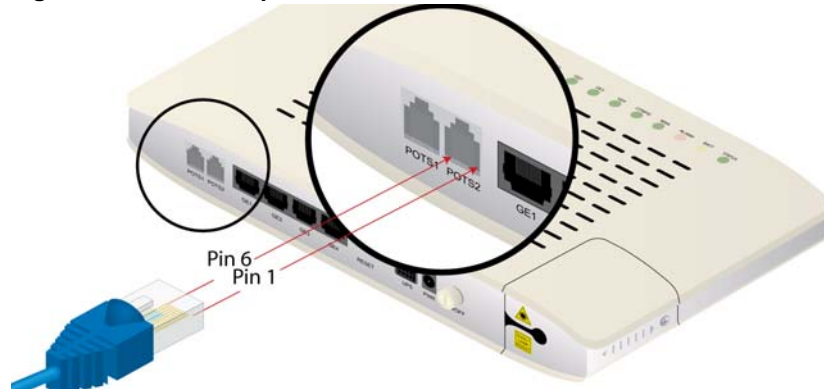


Table 8: Pinout for the POTS RJ11

Pin	Description
1	N/C
2	N/C
3	Ring
4	Tip
5	N/C
6	N/C

UPS pinouts

Figure 22: Pin out layout for the UPS connector

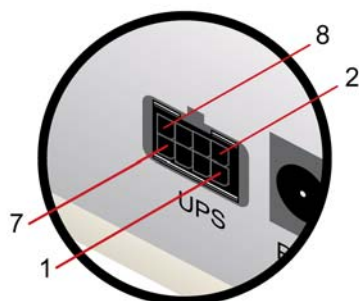


Table 9: Pin out descriptions for the UPS connection

Pin	Signal	Comments
1	+12V	UPS in
2	GND	UPS return. Connected to Signal GND on ONT
3	On battery	Open signal when on battery power
4	Signal return	Connected to Signal GND on ONT
5	Missing battery	Open signal when battery not detected
6	Replace battery	Open signal when battery should be replaced
7	GND	Connected to Signal GND on ONT
8	Low Battery	Open signal when battery is low

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