# Zhone 2800 Series FiberJACK ONT Hardware Installation Guide

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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 Zhone 2800 Series FiberJACK ONT, 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.

**Note:** A note provides important supplemental or amplified information.

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

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

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

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

- The FiberJACK Quick Installation Instructions for the model of ONT you are installing. These instructions are shipped with the ONT, but are also available on the Zhone website.
- *Zhone zNID Configuration Guide* — explains how to use the ONT 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 ONTs |
| 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) |
| USP | Unified Service Provisioning |
| 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 device complies with Part 15 of the FCC Rules / Industry Canada license-exempt RSS standard(s). 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.

*Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.*

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

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.

## MPE Requirements

To satisfy FCC / IC RF exposure requirements, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation.

To ensure compliance, operation at closer than this distance is not recommended.

*Les antennes installées doivent être situées de facon à ce que la population ne puisse y être exposée à une distance de moin de 20 cm. Installer les antennes de facon à ce que le personnel ne puisse approcher à 20 cm ou moins de la position centrale de l' antenne.*

*La FCC des éltats-unis stipule que cet appareil doit être en tout temps éloigné d'au moins 20 cm des personnes pendant son functionnement.*

## Region Selection

Limited by local law regulations, versions for North America do not have region selection options.

The device for operation in the band 5150-5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite.

# CE

CE compliance certifications has been obtained for the following equipment:

- ZNID-GPON-2804P-WAC
- ZNID-GPON-2804P-WDC
- zNID-GPON-2812P-WAC
- zNID-GPON-2812P-WDC
- zNID-GPON-2813P-WAC
- zNID-GPON-2813P-WDC
- zNID-GPON-2814P-WAC
- zNID-GPON-2814P-WDC
- zNID-GPON-2815P-WAC
- zNID-GPON-2815P-WDC
- ZNID-GE-2804P-WAC
- ZNID-GE-2804P-WDC
- zNID-GE-2812P-WAC
- zNID-GE-2812P-WDC
- zNID-GE-2814P-WAC
- zNID-GE-2814P-WDC

The equipment named above is confirmed to comply with the requirements setout 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 V1.9.2: 2011
- ETSI EN 300 328 V1.7.1: 2006
- EN 62311: 2008
- EN 60950-1: 2006+A11 2009+ A1:2010 + A12:2011

# Important Safety Instructions

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

Veuillez lire et respecter toutes les notices d'avertissement et les instructions indiquées sur le produit et inclues 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.

## Electrical Installation Instructions

**WARNING! Installing electrical wires, especially for the AC installations, may be hazardous and could lead to serious injury or possibly death. Disconnect power before conducting the installation. Take all proper precautions or have a qualified electrician perform the tasks for installing electrical wiring.**

- Installing electrical equipment may be hazardous. If you do not have the skills necessary to properly install electrical wiring, do not proceed with the installation, but have a qualified electrician perform the electrical wiring part of the installation.
- Comply with all local building and electrical codes, including the wiring gauge.

## 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 ONT in accordance with national and local electric codes in order to meet all applicable requirements. Consult a qualified electrical consultant.

## 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 matérial brouilleur du Canada.

# 1 ZHONE 2800 SERIES FIBERJACK ONT

This chapter describes the 2800 Series of zNIDs. It includes the following sections:


- Overview, page 15
- Zhone 2800 Series FiberJACK ONT features, page 18
- Zhone 2800 Series FiberJACK ONT models, page 18
- Zhone 2800 Series FiberJACK ONT specifications, page 21
- Zhone 2800 Series FiberJACK ONT dimensions, page 27
- Zhone 2800 Series FiberJACK ONT LEDs, page 32
- Logging in to the 2800 Series ONT, page 35


## Overview

The Zhone 2800 Series FiberJACK ONT zNID (Zhone Network Interface Device) is a family of indoor residential GPON or Gigabit Ethernet fiber based devices which are standards based Consumer Premises Equipment (CPE) designed for advanced triple-play deployments. These indoor models in Zhone's zNID product line of ONT's can be installed directly in the wall using standard size electrical wall outlet boxes.

The Zhone 2800 Series FiberJACK ONTs may be provisioned using the same intuitive Web interface and CLI as the Zhone 2400, 2600 and 4200 Series ONTs, as well as through USP (Unified Service Provisioning), the Zhone Network Management System (ZMS), or using a TR-069-compliant ACS. The GPON ONTs comply with standard OMCI definitions and are manageable at remote sites supporting the full range of FCAPS functions including supervision, monitoring and maintenance.

More information about management capabilities see the *Zhone zNID Configuration Guide*.

## Zhone 2800 Series FiberJACK ONT components

The Zhone 2800 Series FiberJACK ONTs are designed for wall mounting onto a standard 20 cubic inch electrical outlet box.

**Figure 1: LED indicators and buttons on the 280x FiberJACK ONT**

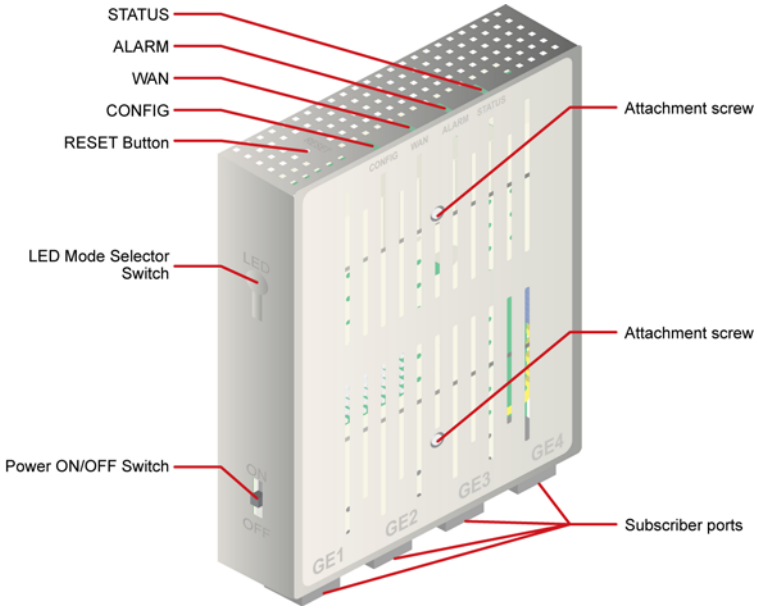
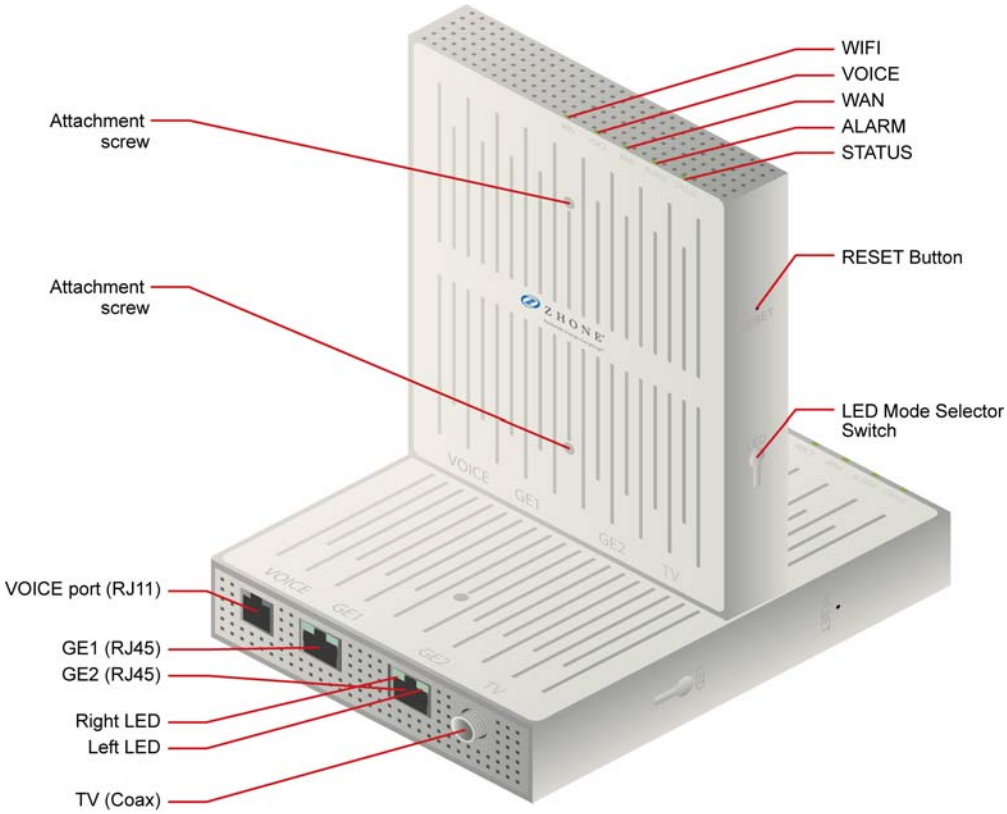



**Figure 2: LED indicators and buttons on the 281x FiberJACK ONT**



Note that the 281x models do not have a power on/off switch

**Figure 3: LED indicators on GigE ports**

See Table 6, Zhone 2800 Series FiberJACK ONT GigE LEDS on page 34.

# Zhone 2800 Series FiberJACK ONT features

All 2800 Series ONTs are designed for indoor use.

The 2800 Series share a common SW architecture with the 2400, 2600, 4200 and 9000 series of zNIDs, including the same intuitive Web interface and command line interface.

This section covers:

- *Zhone 2800 Series FiberJACK ONT models*
- *Zhone 2800 Series FiberJACK ONT specifications*
- *Zhone 2800 Series FiberJACK ONT dimensions*

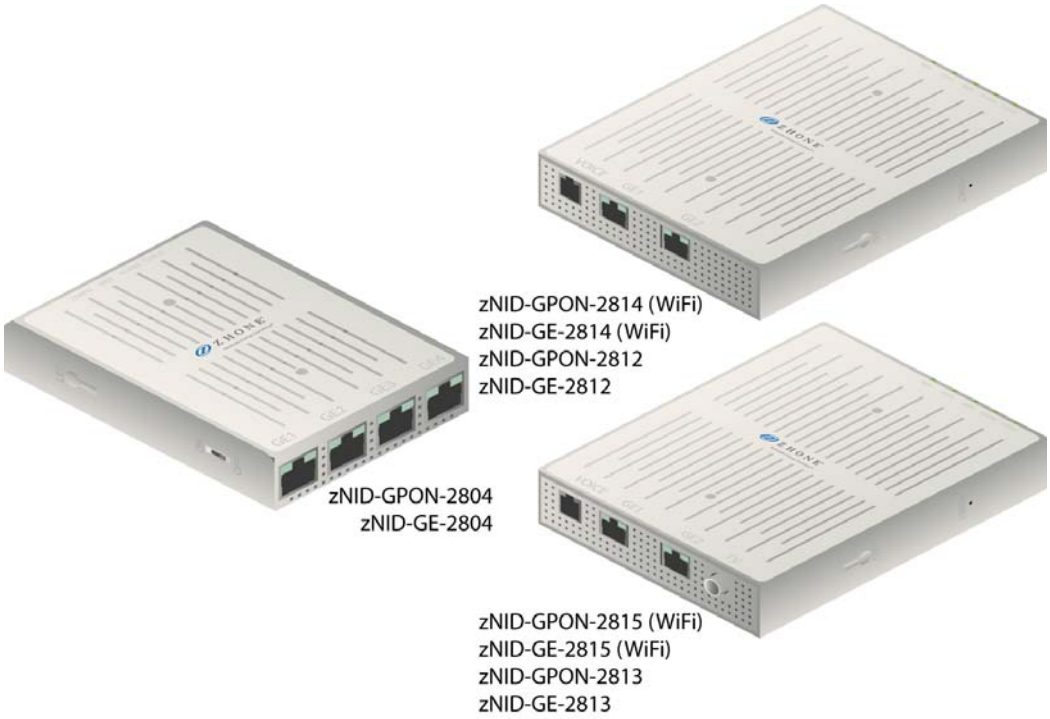
# Zhone 2800 Series FiberJACK ONT models

Other than the color stripe for the SC connector which is not visible with the cover on, the GE and GPON models look the same.

**Figure 4: Zhone 2800 Series FiberJACK ONT**

**Caution:** To ensure adequate ventilation, nothing should be placed against the Zhone 2800 Series FiberJACK ONT. Enough air space, at least one inch should be left around each side of the ONT.

**Figure 5: Zhone 2800 Series FiberJACK ONT models**




## GPON models

The GPON models have the following interfaces:

**Table 2: GPON models and interfaces**

| Model | Description |
|---|---|
| ZNID-GPON-2804P-WAC | GPON ONT, FiberJack, 4 GE w/PoE, AC powered |
| ZNID-GPON-2804P-WDC | GPON ONT, FiberJack, 4 GE w/PoE, DC powered |
| zNID-GPON-2812P-WAC | GPON WAN, FiberJack, 2xGE(PoE), 1xPOTS, AC powered |
| zNID-GPON-2812P-WDC | GPON WAN, FiberJack, 2xGE(PoE), 1xPOTS, DC powered |
| zNID-GPON-2813P-WAC | GPON WAN, FiberJack, 2xGE(PoE), 1xPOTS, RFV, AC powered |
| zNID-GPON-2813P-WDC | GPON WAN, FiberJack, 2xGE(PoE), 1xPOTS, RFV, DC powered |
| zNID-GPON-2814P-WAC | GPON WAN, FiberJack, 2xGE(PoE), 1xPOTS, WiFi, AC powered |
| zNID-GPON-2814P-WDC | GPON WAN, FiberJack, 2xGE(PoE), 1xPOTS, WiFi, DC powered |

**Table 2: GPON models and interfaces**

| Model | Description |
|---|---|
| zNID-GPON-2815P-WAC | GPON WAN, FiberJack, 2xGE(PoE), 1xPOTS, RFV, WiFi, AC powered |
| zNID-GPON-2815P-WDC | GPON WAN, FiberJack, 2xGE(PoE), 1xPOTS, RFV, WiFi, DC powered |

## Gigabit Ethernet models

The Gigabit Ethernet models have the following interfaces:

**Table 3: Gigabit Ethernet models and interfaces**

| Model | Description |
|---|---|
| ZNID-GE-2804P-WAC | Active Ethernet ONT (GE Uplink), FiberJack, 4 GE W/PoE, AC powered |
| ZNID-GE-2804P-WDC | Active Ethernet ONT (GE Uplink), FiberJack, 4 GE W/PoE, DC powered |
| zNID-GE-2812P-WAC | Active Ethernet ONT (GE Uplink), FiberJack, 2xGE(PoE), 1xPOTS, AC powered |
| zNID-GE-2812P-WDC | Active Ethernet ONT (GE Uplink), FiberJack, 2xGE(PoE), 1xPOTS, DC powered |
| zNID-GE-2814P-WAC | Active Ethernet ONT (GE Uplink), FiberJack, 2xGE(PoE), 1xPOTS, WiFi, AC powered |
| zNID-GE-2814P-WDC | Active Ethernet ONT (GE Uplink), FiberJack, 2xGE(PoE), 1xPOTS, WiFi, DC powered |

## Zhone 2800 Series FiberJACK ONT specifications

The possible interfaces and number of interfaces depend on the specific model, see *Zhone 2800 Series FiberJACK ONT models* on page 18 for a list of models and their interfaces.

**Table 4: Zhone 2800 Series FiberJACK ONT common specifications**

| Specifications | Values |
|---|---|
| **Dimensions** | **Inside wall outlet portion (all models)**<br>2.75 in (70 mm) high x 1.75 in (45 mm) wide x 1.25 in (32 mm) deep<br>**Outside wall outlet portion**<br>• zNID 280x models<br>5.7 in (145 mm) high x 4 in (102 mm) wide x 1.2 in (31 mm) deep.<br>• zNID 281x models<br>7.1 in (182 mm) high x 5.5 in (140 mm) wide x 1.2 in (29 mm) deep. |
| **Weight** | • 280x models<br>1 lb (0.45 kg)<br>• 281x models<br>1.2 lb (0.55 kg) |
| **Operating temperature** | 0°C to +40°C (32°F to +104°F) |
| **Storage temperature** | -20° C to +85° C (-4° F to 185° F) |
| **Humidity** | 5% to 95% (non-condensing) |

**Table 4: Zhone 2800 Series FiberJACK ONT common specifications (Continued)**

| Specifications | Values |
|---|---|
| **Power** | • AC models<br>– 2804P<br>- 100-240 VAC 50/60 Hz<br>- Max Power = 40W (ONT + 20W PoE load)<br>- Max Power = 12W (ONT only)<br>– 2810P<br>Input Voltage: 90 to 240 VAC, 50-60 Hz<br>Input Power: 35W (10W ONT plus 15W PoE load)<br>Input Power: 10W (ONT only)<br>• DC models<br>– 2804P<br>- 48 VDC (nom.)<br>- Max Power = 40W (ONT + 20W PoE load)<br>- Max Power = 10W (ONT only)<br>– 2810P<br>Input Voltage: 36 to 56 VDC<br>Input Power: 30W (10W ONT plus 15W PoE load)<br>Input Power: 10W (ONT only) |

**Table 4: Zhone 2800 Series FiberJACK ONT common specifications (Continued)**

| Specifications | Values |
|---|---|
| **Interfaces** | **Uplinks:**<br>• GPON:<br>– SC/APC connector<br>– Full ITU-T G.984 compliance<br>– 1310nm Tx (Upstream)<br>– 1490nm Rx (Downstream)<br>– Fixed SFF optics<br>– Tx (Upstream) line rate 1.25 Gbps<br>– Tx Launch Power: +0.5 to +5.0 dBm<br>– Rx (Downstream) line rate: 2.5 Gbps<br>– Rx Receiver Sensitivity: -28 dBm<br>– Rx Input Power Overload: -8 dBm<br>– Dying gasp support<br>• GE:<br>– SC/UPC connector<br>– 1310nm Tx (Upstream)<br>– 1490 nm Rx (Downstream)<br>– Fixed SFF optics<br>– Tx data rate 1.0 Gbps<br>– Tx Launch Power: -8.0 to -2.0 dBm<br>– Rx data rate: 1.0 Gbps<br>– Rx Receiver Sensitivity: -23 dBm<br>– Rx Input Power Overload: -2 dBm<br>**Customer facing interfaces (Depends on model):**<br>– **GE ports**<br>– RJ-45 Jacks<br>– 2 or 4 x 10/100/1000 Base-T ports<br>– Meets IEEE 802.3 specifications<br>– Auto-MDI/MDIX and auto speed supported<br>– Per-port Link/Activity, Speed, and PoE status indicators<br>– PoE support on all ports<br>– Max 20W PoE load per ONT (2804P models)<br>– Max 15W PoE load per ONT (281xP models)<br>– **POTS interfaces** (RJ11)<br>– **Wi-Fi interface** (Dual 802.11b/g/n)<br>– **Coaxial interface** (RF video overlay (47–870MHz)) |

**Table 4: Zhone 2800 Series FiberJACK ONT common specifications (Continued)**

| Specifications | Values |
|---|---|
| **Standards Support** | • ITU-T G.984 compliant (GPON)<br>• IEEE 802.3 Ethernet<br>• IEEE 802.1q/p VLANS<br>• IEEE 802.3u Fast Ethernet<br>• IEEE 802.3ab 1000Base-T<br>• 802.3at compliant<br>• 802.1x (specific models)<br>• IEEE 802.3z Gigabit Ethernet<br>• IEEE 802.1d Bridging<br>• IEEE 802.3u 10/100 Base-TX (Ethernet I/F)<br>• K.20 Surge Immunity |
| **POTS (Voice) Support** | • SIP (RFC 3261)<br>• MGCP<br>• 5 REN per line, balanced Ring at 60V RMS, DTMF dialing<br>• Multiple voice codec: G.711 (u/a-law), G.726, G.729 (A and B)<br>• Echo Canceling, Voice Activity Detection (VAD), Comfort Noise Insertion (CNI)<br>• Various CLASS services — Caller ID, Call Waiting, Call Forwarding, Call Transfer, etc.<br>• T.30 and T.38 Fax<br>• G.711 fallback for FAX<br>• Pulse metering |
| **Wireless (WiFi) Support** | • 2x2 MIMO<br>• Antenna: 4dBi for 2.4GHz; 6dBi for 5GHz<br>• Max WiFi power: 37mW; radio band – selectable 2.4 GHz or 5.0GHz<br>• max number of subscribers: 16 per SSID<br>• SSID support: 4<br>• 1:1 mapping of SSIDs to VLANs<br>• WEP, WPA-PSK, WPA2-PSK (AES, TKIP)<br>• 802.1x<br>• 64 bit and 128 bit WEP support<br>• MAC address filtering |
| **IPTV** | • IGMP multicast<br>• IGMPv2 snooping |

**Table 4: Zhone 2800 Series FiberJACK ONT common specifications (Continued)**

| Specifications | Values |
|---|---|
| **Protocol Support** | • GPON<br>– ITU-T G.984 (GPON)<br>– 32 T-CONTS per device<br>– 32 GEM Ports per device<br>– Activation with automatic discovered SN and password in conformance with ITU-T G.984.3<br>– AES-128 Decryption with key generation and switching<br>– FEC (Forward Error Correction)<br>– 802.1p mapper service profile on U/S<br>– Support for Multicast GEM Port QoS<br>• QoS<br>– Ethernet bridging/switching per IEEE 802.1D/802.1Q<br>– Traffic management (priority queuing)<br>– QoS with support for IEEE 802.1p + DSCP VLANS<br>• VLANs<br>– Per port IEEE 802.1Q VLAN ID processing<br>– All VLAN IDs supported<br>– VLAN tagging/untagging<br>– VLAN Stacking (QinQ)<br>– VLAN Switching<br>• Layer 2<br>– 802.3n flow control<br>– Automatic MAC learning and aging<br>– Unlimited # of MAC addresses for OMCI-configured flows<br>– Support for up to 4,096 MAC addresses for RG traffic flows<br>– Broadcast storm control<br>– LLDP-MED<br>• IP Routing and Firewall<br>– PPPoE<br>– NAT/NAPT<br>– Port forwarding<br>– DHCP Server<br>– DNS Server<br>– UPnP |

**Table 4: Zhone 2800 Series FiberJACK ONT common specifications (Continued)**

| Specifications | Values |
|---|---|
| **Management** | • ZMS (Zhone Management System)<br>• OMCI<br>• Web UI<br>• Command Line Interface<br>• SNMP<br>• USP (Unified Service Provisioning)<br>• TR-069 |
| Regulatory Compliance | • CE<br>• UL<br>• FCC Part 15, Class B<br>• FDA 21CFR1040 |

# Zhone 2800 Series FiberJACK ONT dimensions

**Figure 6: Zhone 280x Series FiberJACK ONT dimensions**

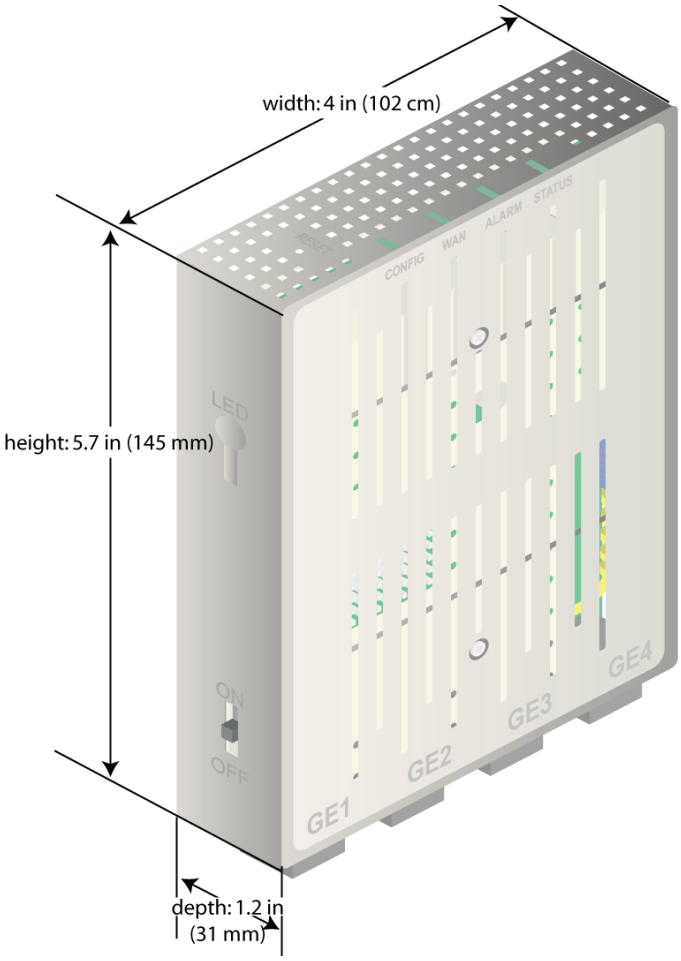
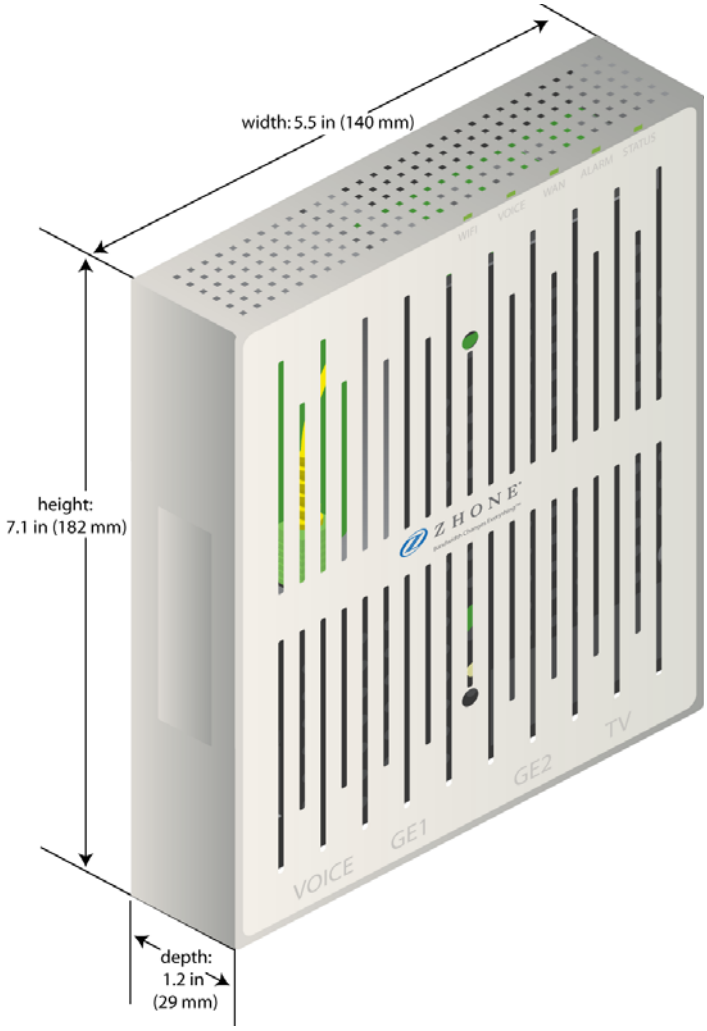


**Figure 7: Zhone 281x Series FiberJACK ONT dimensions**



# Zhone 2800 Series FiberJACK ONT controls and switches

This section describes the 2800 Series FiberJACK ONT controls:

- Power On/Off Switch
- Reset Button
- LED Mode Selector Switch
- Tamper Detection Switch

**Figure 8: 280x Series FiberJACK ONT controls and switches**

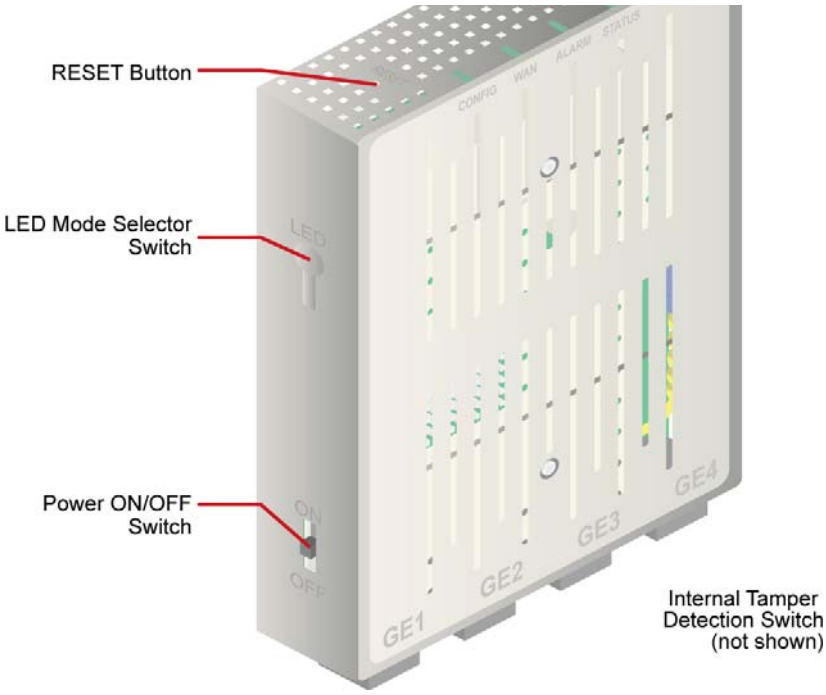
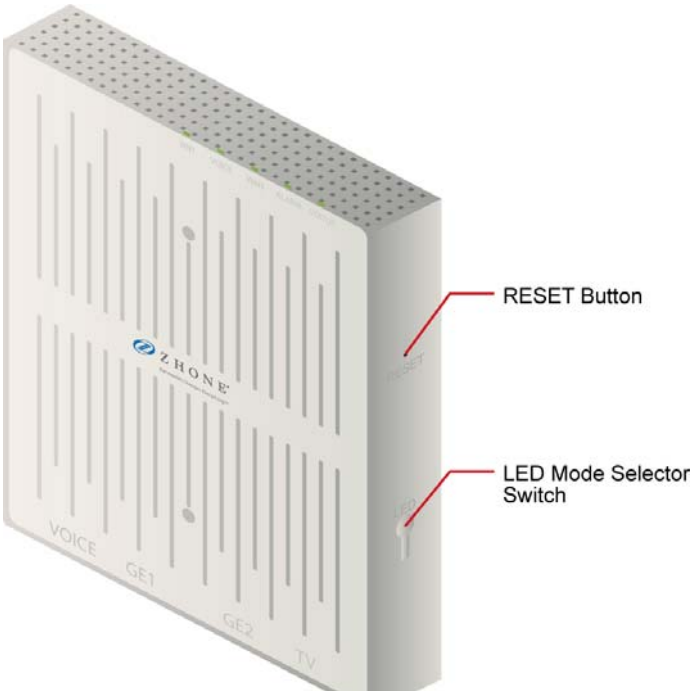


**Figure 9: 281x Series FiberJACK ONT controls and switches**




## Power On/Off Switch

**zNID 280x models**. The Power On/Off Switch is located on the left side of the 280x ONT faceplate.

**zNID 281x models**. The Power On/Off Switch is located on the right side, above the Reset Switch but is under the faceplate.

This switch is primarily for Installation Technicians, providing them with an easy means to control power on/off for the unit during the installation or troubleshooting process while the faceplate is removed.

A slot on the left side of the faceplate provides a means to power on/off the unit without having to remove the faceplate using a pen cap, paper clip or small slot screwdriver.

## Reset Button

The unit can be reset by depressing the Reset Button for less than 10 seconds. Holding the Reset Button until all the LEDs illuminate (approximately 10 seconds) will reset the configuration to factory defaults and also reboot the device.

**zNID 280x Models**

The Reset Button is accessible through a hole on the top of the unit (with the Faceplate installed).

**zNID 281x Models**

The Reset Button is accessible through a hole on the right side of the unit (with the Faceplate installed).

## LED Mode Selector Switch

The LED Mode Selector Switch is used to toggle through the three LED operating modes to select the desired behavior.

- Day Mode (All LEDs enabled)
- Night Mode (WAN LED and Alarm LED ONLY)
- Off Mode (All LEDs disabled)

The LED mode is written to FLASH after a 3 second de-bounce delay to ensure that the configured LED state is retained over a power cycle.

The button needs to be depressed for 10 seconds, to switch between the modes.

**zNID 280x Models**

The switch is located on the left side of the faceplate, above the Power switch.

**zNID 281x Models**

The switch is located on the right lower side of the faceplate.

## Tamper Detection Switch

A Tamper Detection Switch is used to detect if the faceplate has been removed. Upon detection, an SNMP Trap is generated and a Syslog Event captured to record the date and time of the faceplate removal. The red Alarm LED will not be lit, as this is a “silent alarm” event.

# Zhone 2800 Series FiberJACK ONT LEDs

**Figure 10: zNID-GPON-280x LEDS**

**Figure 11: zNID-GPON-281x LEDS**

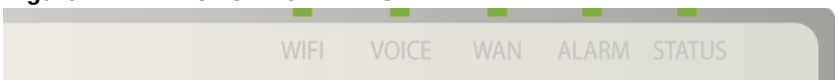



**Table 5: zNID-GPON-2800 LEDs**

| LED Name | Color | Behavoir | Indicates |
|---|---|---|---|
| CONFIG | Green | Solid On | Unit is provisioned (provisioning is complete) |
| | Green | Rapid blink (10/sec) | OMCI provisioning is in progress* |
| | Green | Slow blink (1/sec) | SNMP provisioning is in progress* |
| | N/A | Off | Unit is not provisioned |
| WAN | Green | Solid On | Ranged successfully |
| | Green: | Slow blink (1/sec) | Ranging in progress |
| | N/A | Off | Not ready for ranging or not provisioned |
| ALARM | Red | Solid On | Major alarm is active |
| | Red | Red: 50% cycle:<br>(1 sec Rapid Blink/1 sec Off) | EZ Touch actions pending -- SW or Config update required |
| | N/A | Off | Normal operation on AC power |

**Table 5: zNID-GPON-2800 LEDs**

| LED Name | Color | Behavoir | 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 (1 sec rapid blink/1 sec off) | EZ Touch communications in process |
| | Green | Slow blink (2/second) | Remote Mgt Access (OMCI, SNMP, HTTP, Telnet, or TR-069) |
| | Green | Solid On | Reboot or restart in process |
| | N/A | Off | Power off |
| WIFI | Green | Solid On | WiFi is enabled by not actively sending/receiving traffic |
| | Green | Fast Blink -- variable rate | WiFi traffic is actively being sent or received |
| | N/A | Off | WiFi is disabled |
| VOICE | Green | Solid On | Voice is Registered but idle |
| | Green | Slow Blink -- 2 pulses per sec ( .25 sec ON / .25 sec OFF ) | Voice is Active (off-hook, or incoming call is Ringing) |
| | N/A | Off | Voice is not Registered |

* Unified Service Provisioning uses OMCI and SNMP to provision the ONT depending on the feature being provisioned.

**Figure 12: Zhone 2800 Series FiberJACK ONT GigE LEDS**

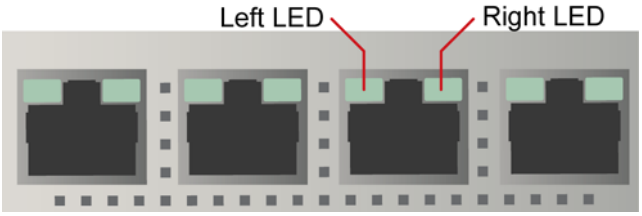


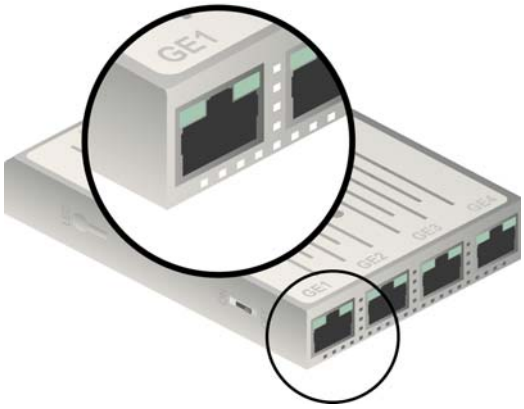

**Table 6: Zhone 2800 Series FiberJACK ONT GigE LEDS**

| LED Name | Color | Indicates |
|---|---|---|
| **Right LED (SPEED)** | Off | 10 BaseT |
| | Yellow | 100 Base T |
| | Green | 1000 Base T |
| **Left LED (LINK/ ACTIVITY** | Off | Link Down or Port Disabled |
| | Yellow: Solid on | Link up, no Tx/Rx traffic |
| | Yellow: Blinking | Link up, Tx/Rx traffic present |
| | Green: Solid on | Link up with PoE Power being delivered, no Tx/Rx traffic |
| | Green: Blinking | Link up with PoE Power being delivered, Tx/Rx traffic present |

# Logging in to the 2800 Series ONT

This section describes logging into the FiberJACK ONT locally with a browser or CLI (telnet) using the subscriber facing LAN port, GE1. This section assumes the ONT is in a default state with factory settings, including the default factory IP address.

**Figure 13: Log into GigE port to reach the Web UI or CLI on the zNID**




**Note:** The 2800 Series ONT may be managed by other means, however this guide only describes local management.

**Note:** If, after powering on, the FiberJACK ONT does not respond to the browser, telnet or a ping test, reset the ONT to make sure the ONT is in a known state. See Reset Button, page 31.

### To login with a browser:

1. Connect an Ethernet cable from your computer to a GigE port on the ONT.
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 a GigE port on the ONT.
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 ZHONE 2800 SERIES FIBERJACK ONT INSTALLATION

This chapter describes the procedures for installing the FiberJACK ONT. The FiberJACK ONT comes complete with all hardware for installation into a standard single-gang electrical wallbox with 3.25 inches between vertical mounting holes. A metal wallbox should be used.

This section applies to FiberJACK ONTs that are AC-powered or DC powered. It includes the following sections:

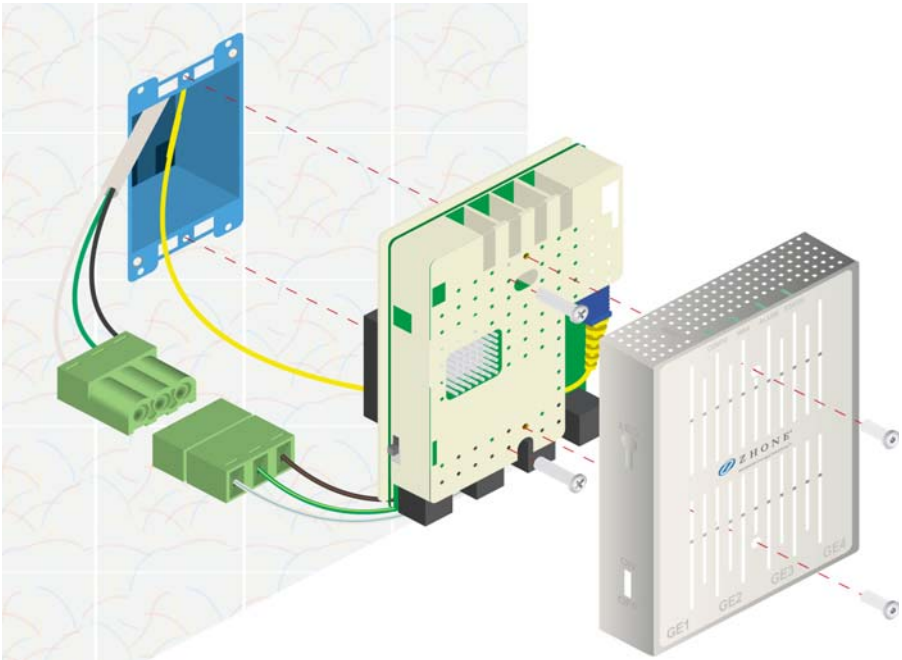

- Install the FiberJACK ONT, page 38
- Installation precautions, page 39
- Power connections, page 50
- Manage the optical cable, page 54
- Fiber handling, page 54
- Testing optical power, page 54
- Connect to network cautions, page 55

# Install the FiberJACK ONT

This section describes the procedures for installing the FiberJACK ONT. The FiberJACK ONT comes complete with all hardware for installation into a standard single-gang electrical wallbox with 3.25 inches between vertical mounting holes. A metal wallbox should be used. This installation guide applies to FiberJACK ONTs that are AC powered or DC powered.

## zNID 2800P series FiberJACK ONT installation overview

**Figure 14: Exploded view of FiberJACK ONT installation with 3 pin connector**




1. Select location for the FiberJACK ONT
2. Provide power to the wallbox

   There are different power connection steps depending on whether connecting to AC power, DC power from PoE, or two-wire DC power.
3. Provide fiber to the wallbox
4. Connect power and the fiber
5. Secure the FiberJACK ONT to the wallbox
6. Attach the FiberJACK ONT faceplate
7. Connect subscriber services

## Installation precautions

**WARNING! Installing electrical wires, especially for the AC installations, may be hazardous and could lead to serious injury or possibly death. Disconnect power before conducting the installation. Take all proper precautions or have a qualified electrician perform the tasks for installing electrical wiring.**

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.

Resilient, Bend-Insensitive Fiber Optic Cabling such as the Corning 4.8mm ClearCurve™ ZBL Drop Cable must be run to the box. This type of fiber has <0.1dB loss for a 5mm radius loop.

**Note:** Sharp bends in non-bend-insensitive fiber cables create undesirable optical attenuation or loss. A minimum bend radius of 30 mm (1.2 in) is recommended for stripped fiber so non-bend-insensitve fiber is not sufficient for use with the Zhone 2800 Series FiberJACK ONT.

## zNID 2800P series FiberJACK ONT installation procedure

**1** Select location for the FiberJACK ONT

The location for the FiberJACK ONT should be free of dust and moisture. The area in front of the FiberJACK ONT should be left open so that there is sufficient ventilation for the ONT.

Select one of the mounting options, depending on the location for the wallbox:

– Add a new wallbox and AC circuit.

  This method may involve the most construction, but provides the greatest flexibility.

– Add a new wallbox adjacent to (within 6" of) an existing outlet.

  This method is the preferred and simpler solution for most commercial and hospitality installations when using an "old-work" wallbox.

– Replace an existing AC outlet with FiberJACK ONT.

  This method may be the simplest installation if the location is suitable and the wallbox is not too full of splices and connectors.

– Add a new wallbox and DC circuit.

  The steps presented for the DC powered installation do not require a licensed electrician, due to the low voltages involved.

**2** Provide power to the wallbox

Depending on the power source and wallbox combination use the following options:

– Providing power to AC powered ONTs, new wallbox, page 46

– Providing power to AC powered ONTs, replacing an outlet in an existing wallbox, page 48

– Providing power for DC powered ONTs, page 49

**WARNING! Installing electrical wires, especially for the AC installations, may be hazardous and could lead to serious injury or possibly death. Disconnect power before conducting the installation. Take all proper precautions or have a qualified electrician perform the tasks for installing electrical wiring.**

**3** Provide fiber to the wallbox

**a** Run resilient bend-insensitive fiber optic cabling (such as the Corning 4.8mm ClearCurve™ ZBL Drop Cable) to the box

**b** Route the fiber as desired for the final installation, and then cut the fiber for proper termination length

  The terminated fiber needs to extend 6" (150mm) from the wall.

**c** The fiber must then be properly terminated with an SC/APC connector for GPON ONT models or with an SC/UPC connector for GE ONT models.

**4** Connect power and the fiber

**a** Remove the wallbox cover (if present)

**b** Remove the faceplate from the base assembly of the FiberJACK ONT by unscrewing the two security (hex-pin) screws with a #T10 Security Torx screwdriver or equivalent

**c** Slide the faceplate straight down (toward the GE LAN ports) approximately 1/4" until you feel the two retention latches un-snap

**d** Verify that the GE LAN port holes in the faceplate are clear of the RJ45 connectors, so that the faceplate may be lifted straight up and off

**e** Connect Power to the FiberJACK ONT

– **For AC powered ONTs**

Always disconnect power before conducting the installation on AC circuits.

Put the ONT Power Switch on the lower left side into the OFF (down) position using a pen cap, paper clip or small slot screwdriver.

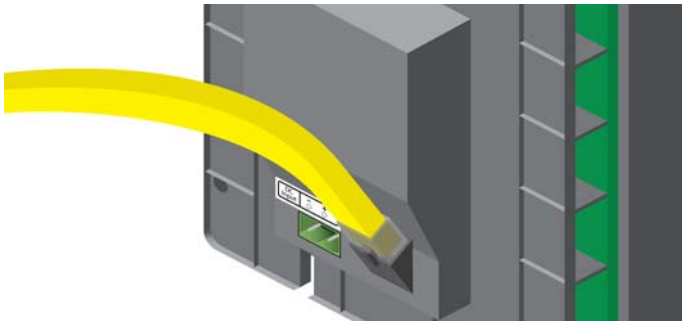
Connect the ONT Power Pigtail (attached to the FiberJACK ONT) to the AC Power Pigtail coming from the wallbox.

Fold and tuck the excess wiring back into the wallbox

– **For DC powered ONTs**

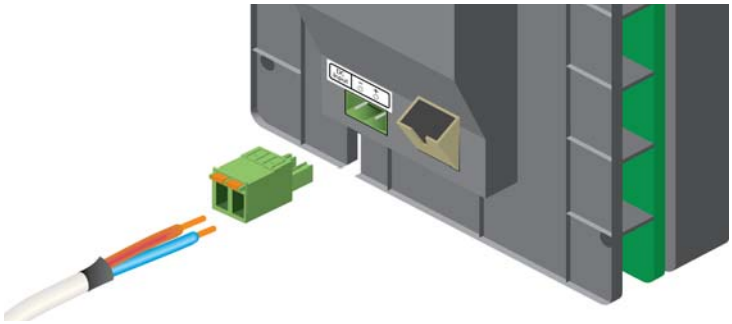
Put the ONT Power switch on the lower left side into the Off (down) position using a pen cap, paper clip, or small slot screwdriver.

**PoE source:**



When powering from a PoE source, plug the terminated CAT5 or CAT6 cable into the RJ45c connector on the back of the FiberJACK ONT, and fold the excess cable into the wallbox.

**2-wire DC source:**



When powering from a 2-wire DC source, strip the insulation back from the ends of the 2-wire DC cable to expose about 15mm (0.6") of bare copper wire.

Connect these wires to the 2-pin connector on the back of the FiberJACK ONT.

Check that the polarity is correct before connecting the wires. The positive terminal is on the right (closest to the RJ-45 connector).

**Note:** There is protection for the FiberJACK ONT from reversed polarity, however the FiberJACK ONT will not power up if the polarity is reversed.

**f** *zNID 281x models:* Remove fiber area cover.

**g** Route the fiber pigtail from the wallbox through the notch in the circuit board in the lower right of the FiberJACK ONT (see Figure 15, 280x Models: Thread the fiber cable through the notch in the circuit board.)

**Figure 15: *280x Models:* Thread the fiber cable through the notch in the circuit board.**

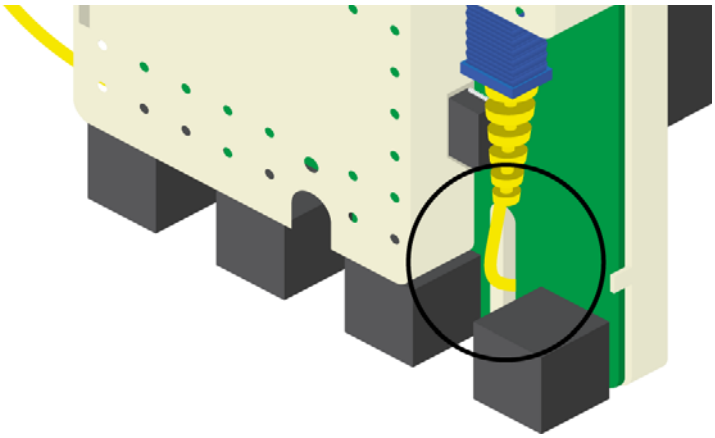
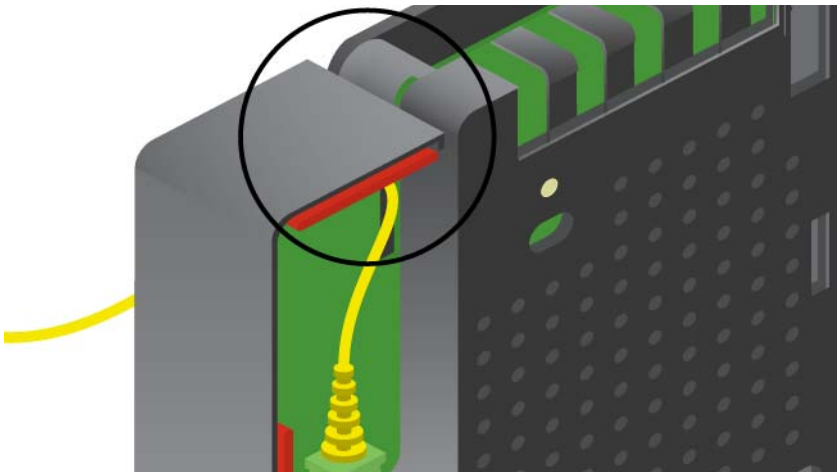


**Figure 16: *281x Models:* Thread the fiber cable through the notch in the circuit board.**



Other than the connector type, fiber installation is the same for GPON and GE models. See Manage the optical cable, page 54 and page 55 for more information.

**h** Remove the dust covers from the SC connector on the FiberJACK ONT, and from the SC/APC or SC/UPC termination on the fiber pigtail.

**i** Insert the fiber pigtail securely into the SC connector on the FiberJACK ONT

**j** *zNID 281x models:* Replace fiber area cover.

Make sure the fiber does not get pinched when positioning the FiberJACK ONT base assembly into the wallbox over the wallbox mounting holes.

**5** Secure the FiberJACK ONT to the wallbox

– For mounting into a plastic wallbox, the two self-tapping screws (included) are used.

– For mounting into a metal wallbox, the two machine-thread screws (included) are used.

**a** Insert one mounting screw into the upper mounting hole of the FiberJACK ONT base assembly and turn it clockwise several revolutions, but do not completely tighten it.

Leaving the screw loose will be sufficient to hold the ONT base assembly in place while powering up the ONT and verifying that it can range and connect to the OLT.

**b** Provide power to the circuit (via breaker or fuse)

**c** Turn on the Power Switch (lower left side of the FiberJACK ONT) by sliding it to the ON (up) position.

**d** Verify that the red Alarm LED turns on, and remains on until the GPON link successfully ranges or until the active Ethernet WAN connection is up (for Active Ethernet ONTs)

If the GPON link does not range (or the GE link does not come up) troubleshoot the installation in conjunction with the staff responsible for OLT and ONT provisioning.

**e** Once the Alarm LED has turned OFF, insert a second mounting screw into the lower mounting hole of the FiberJACK ONT base assembly and tighten it completely while ensuring that the FiberJACK ONT is properly leveled.

**f** Tighten the top mounting screw so the FiberJACK ONT is securely fastened to the wall.

**6** Attach the FiberJACK ONT faceplate

**a** Place the FiberJACK ONT faceplate over the mounted ONT base assembly and push upwards approx 1/4" until you feel the two retention latches snap together.

**b** Secure the faceplate using the two security (hex-pin) screws with a #T10 Security Torx screwdriver or equivalent.

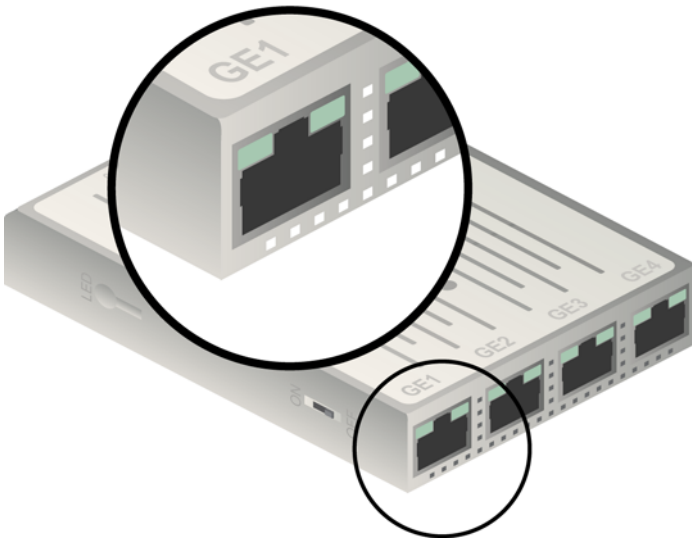
**7** Connect subscriber services

**Connect subscriber Ethernet services**

The FiberJACK provides up to four GE LAN ports using RJ45 modular jacks for Ethernet connections. These 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.

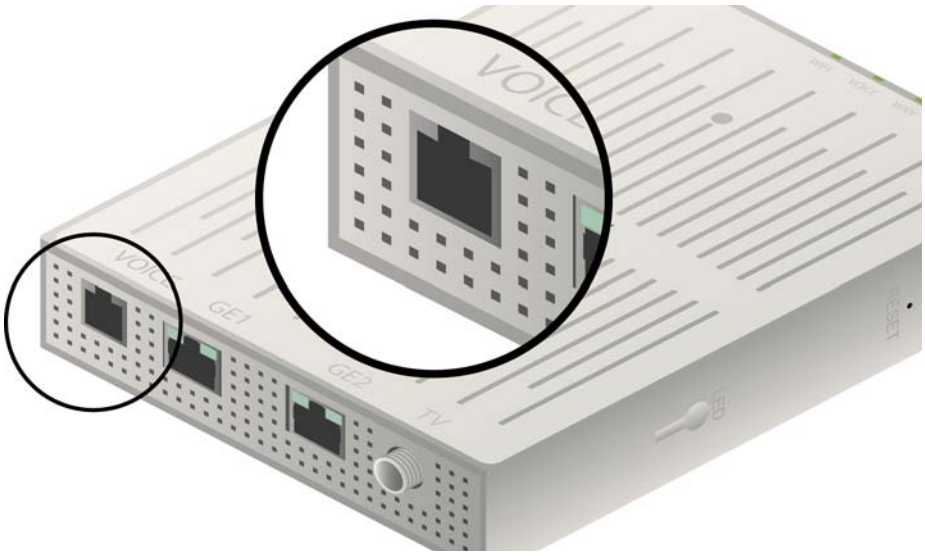
**Figure 17: The RJ-45 Ethernet ports.**



If the cable is not terminated, follow local practices to attach an RJ-45 connector.

**Connect telephone (POTS) service**

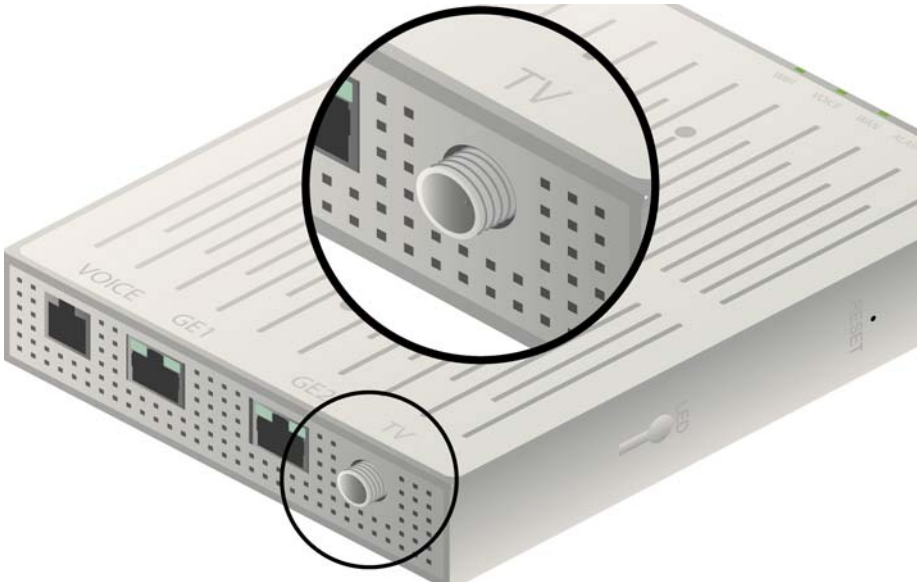
**Figure 18: The voice port (POTS).**




Plug the line from the telephone into the POTS port.

**Connect coaxial service**

**Figure 19: The TV port (coaxial).**




**a** Locate the premises' coaxial cable.

**b** If the cable is not terminated, follow local practices to attach a coaxial connector.

**c** Screw the coaxial connector to the TV coaxial port.

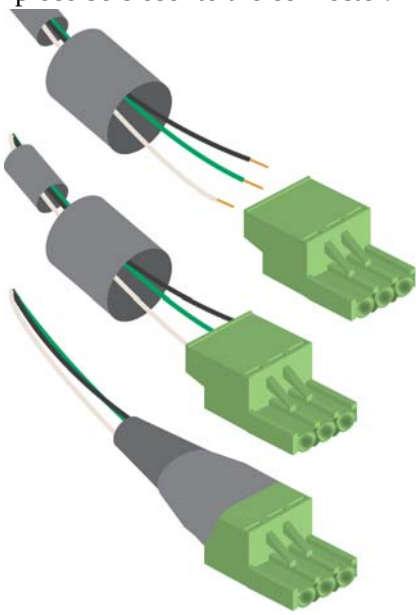
# Providing power to the wallbox

**WARNING! Installing electrical wires, especially for the AC installations, may be hazardous and could lead to serious injury or possibly death. Disconnect power before conducting the installation. Take all proper precautions or have a qualified electrician perform the tasks for installing electrical wiring.**

## Providing power to AC powered ONTs, new wallbox

**For AC powered ONTs, new wallbox**

1. Turn off any electricity running to the wallbox circuit.
2. Check that the wallbox is mounted securely (new or old work style wallbox). A plastic or a metal wallbox can be used.
3. Non-metallic ("Romex") or flexible metal-clad ("BX") AC cabling should be used per local electrical code requirements.
4. Strip back the outer sheath of the AC cable wires in the wallbox, exposing the three conductors (Hot, Neutral, and Ground) inside.
5. Trim the length of the Hot, Neutral, and Ground conductors from the outlet box to have approximately 4 to 5 inches of working length.
6. Strip the insulation back from the ends of the Hot, Neutral and Ground conductors to expose about 15mm (0.6") of bare copper wire.
7. Add two lengths of heat-shrink tubing — 30mm and 40mm diameter — over the end of the wires and slide back to make the connection. Have the larger diameter piece be closer to the connector.



**8** Connect the female, 3-pin, terminal-style connector to the stripped ends of the AC wires prepared in Step 6.

Make sure that the three AC wires are connected to the correct pins by checking the wiring chart shown in *Power connections* on page 50.

**9** Pull the heat-shrink tubing down which is closest to the connector and pull it down and stretch it so it will cover the terminal screws, then apply appropriate heat to shrink the larger diameter piece of tubing to the connector.

Pull the second smaller diameter heat-shrink tubing down over the end of the other molded tubing, then apply appropriate heat to shrink the smaller diameter piece of tubing over the end of the larger diameter piece to present a fully-insulated AC Power pigtail connection.

This connection can be pushed into the wallbox and a wallbox cover added if the FiberJACK ONT will be installed at a later time.

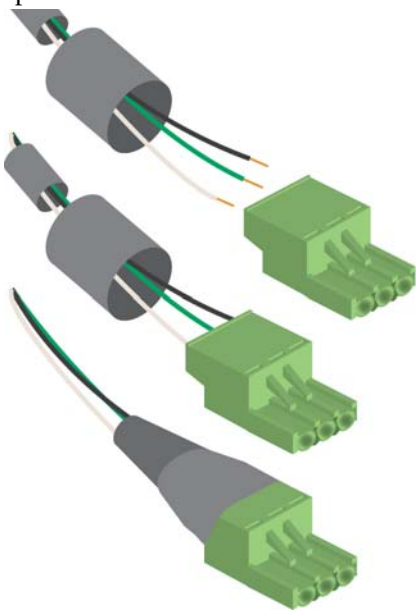
**Note:** The AC Powered ONTs have an ONT Power Pigtail with a male connector designed to connect to the female AC Power Pigtail connector.

## Providing power to AC powered ONTs, replacing an outlet in an existing wallbox

1. Turn off any electricity running to the wallbox.
2. Check that the outlet has sufficient space available inside for mounting the FiberJACK ONT

   The wallbox should have 3" (70mm) of unimpeded depth to allow for splices and connectors.
3. Partially remove the outlet from the wallbox, disconnect the AC wires attached to it, and label them for identification if necessary.

   These wires need to have approximately 4 to 5 inches of working length.
4. If necessary, strip the insulation back from the ends of these Hot, Neutral and Ground wires to expose about 15mm (0.6") of bare copper wire.
5. Add two lengths of heat-shrink tubing — 30mm and 40mm diameter — over the end of the wires and slide back to make the connection. Have the larger diameter piece be closer to the connector.



6. Connect the female, 3-pin, terminal-style connector to the stripped ends of the AC wires prepared in Step 4.

   Make sure that the three AC wires are connected to the correct pins by checking the wiring chart shown in *Power connections* on page 50.
7. Pull the heat-shrink tubing down which is closest to the connector and pull it down and stretch it so it will cover the terminal screws, then apply appropriate heat to shrink the larger diameter piece of tubing to the connector.

Pull the second smaller diameter heat-shrink tubing down over the end of the other molded tubing, then apply appropriate heat to shrink the smaller diameter piece of tubing over the end of the larger diameter piece to present a fully-insulated AC Power pigtail connection.

This connection can be pushed into the wallbox and a wallbox cover added if the FiberJACK ONT will be installed at a later time.

**Note:** The AC powered ONTs have an ONT Power Pigtail with a male connector designed to connect to the female AC Power Pigtail connector.

## Providing power for DC powered ONTs

The DC powered FiberJACK ONT may be powered from a PoE source, or from a 2-wire DC feed.

- Provide power from a Power over Ethernet source

  When powering from a PoE source, run a CAT5 or CAT6 cable from the DC power source into the wallbox.

  If the PoE cable is not terminated, follow local practices to attach an RJ-45 connector. See *RJ-45 DC Power over Ethernet connection on page 52* for pinout information.

  The terminated PoE cable fiber needs to extend 6" (150mm) from the wall.

- When powering from a 2-wire DC source, run a low-voltage 2-wire cable from the DC power source into the wallbox. See *2 pin DC connection on page 52* for information.

# Power connections

- For 115/120VAC connections
- For 115/120VAC connections with wire nuts
- For 220/240VAC connections
- For two pin DC connections
- For RJ-45 Power over Ethernet

**WARNING! Installing electrical wires, especially for the AC installations, may be hazardous and could lead to serious injury or possibly death. Disconnect power before conducting the installation. Take all proper precautions or have a qualified electrician perform the tasks for installing electrical wiring.**

## 3 pin ONT power pigtail for 115/120VAC connections

**Figure 20: 3 pin ONT power pigtail**

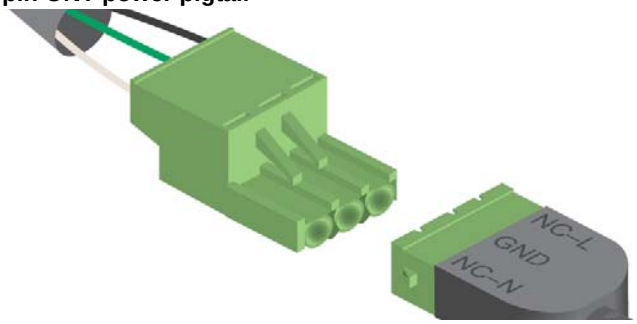



**Table 7: For 115/120VAC connections**

| Wallbox Side | | Connector Pin | FiberJACK Side | |
|---|---|---|---|---|
| **Name** | **Typical Color** | | **Name** | **Color** |
| Neutral | White | 1 | AC-N | White with blue stripe |
| Ground | Green | 2 (center) | GND | Green with yellow stripe |
| Hot or Live | Black | 3 | AC-L | Black with brown stripe |

## 3 wire ONT power for 115/120VAC connections using wire nuts

**Figure 21: 3 pin ONT power pigtail**

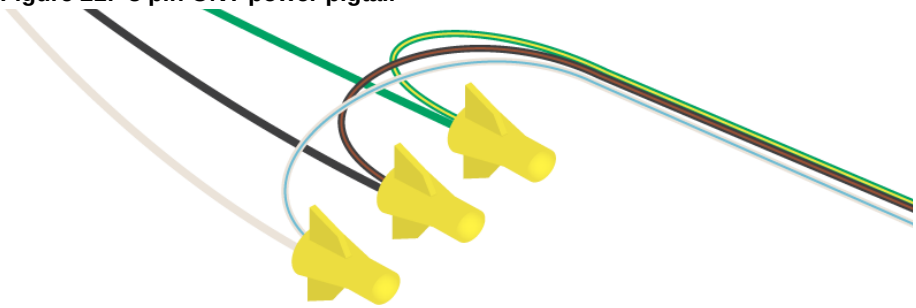


**Table 8: For 115/120VAC connections with wire nuts**

| Wallbox Side | | FiberJACK Side | |
|---|---|---|---|
| **Name** | **Typical Color** | **Name** | **Color** |
| Neutral | White | AC-N | White with blue stripe |
| Ground | Green | GND | Green with yellow stripe |
| Hot or Live | Black | AC-L | Black with brown stripe |

## 3 pin ONT power pigtail for 220/240VAC connections

**Figure 22: 3 pin ONT power pigtail for 220/240VAC**

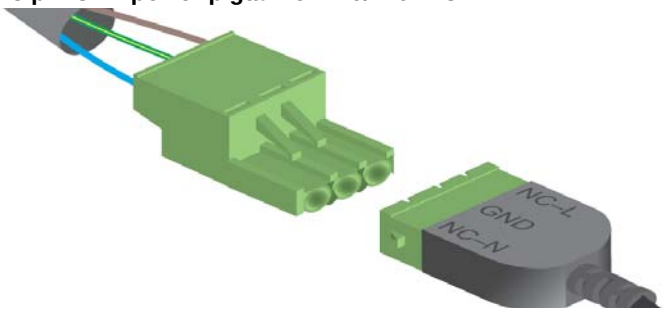



**Table 9: For 220/240VAC connections**

| Wallbox Side | | Connector Pin | FiberJACK Side | |
|---|---|---|---|---|
| **Name** | **Typical Color** | | **Name** | **Color** |
| Neutral | Blue | 1 | AC-N | White with blue stripe |
| Ground | Green with yellow stripe | 2 (center) | GND | Green with yellow stripe |
| Line | Brown or black | 3 | AC-L | Black with brown stripe |

## 2 pin DC connection

**Figure 23: 2 pin DC connection**

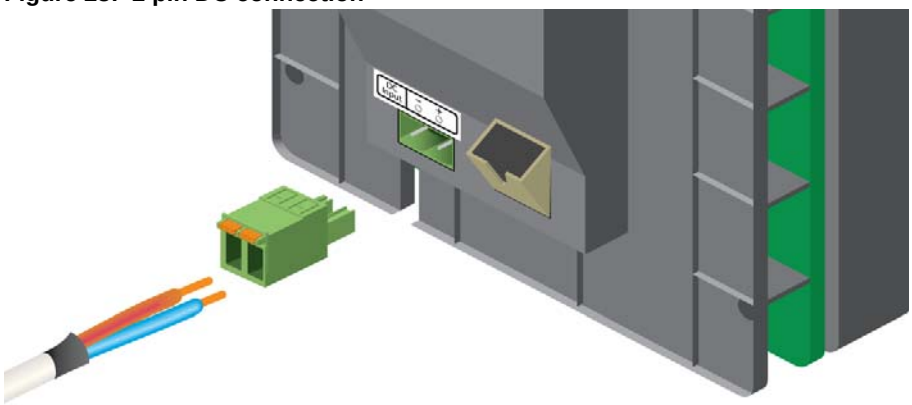


**Table 10: For two pin DC connections**

| Wallbox Side | | Terminal | FiberJACK ONT |
|---|---|---|---|
| **Name** | **Typical Color** | | **Name** |
| + 48V | any | 1 | +VDC |
| +48V Return | any | 2 | -VDC |

## RJ-45 DC Power over Ethernet connection

The Power over Ethernet port on the back of the 2804P base assembly only provides power to the ONT. It is NOT an Ethernet LAN or WAN port.

**Figure 24: RJ-45 Power over Ethernet connection**

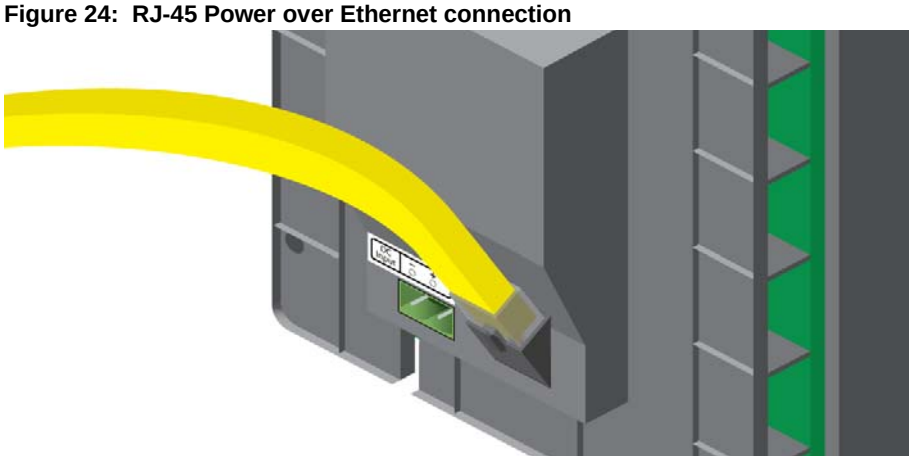


**Table 11: For RJ-45 Power over Ethernet**

| Pins(1) | Name | Definition(2) | | |
|---|---|---|---|---|
| | | **2-pair Mode A** | **2-pair Mode B** | **4-pair** |
| 1 and 2 | Pair 1 | DC in | | DC in |
| 3 and 6 | Pair 2 | Return | | Return |
| 4 and 5 | Pair 3 | | DC in | DC in |
| 7 and 8 | Pair 4 | | Return | Return |

(1) RJ-45 pins shown are connected together within the 2804P ONT.

(2) The polarity of DC In with respect to Return can be positive or negative.

# 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.

## Testing optical power

Table 12, Table 13, and Table 14 indicate various optical thresholds for the ONTs.

**Table 12: Optical thresholds for the zNID-GPON-2800 Series ONTs**

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

**Table 13: Optical thresholds for the zNID-GE-2810 Series ONTs**

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

**Table 14: RF Overlay optical thresholds for the zNID-GPON-2810 Series ONTs**

| Parameter | 1550 nm (RF Video Overlay Downstream) |
|---|---|
| Damage Level | +5 dBm |
| Linear Operating Range | -8.0 dBm to +2.0 dBm |
| Mid Range Optical Value | -3.0 dBm |

# Connect to network cautions

When connecting 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.**

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.

**Figure 25: The zNID-GPON-2800 models use fiber with an SC/APC connector (green)**

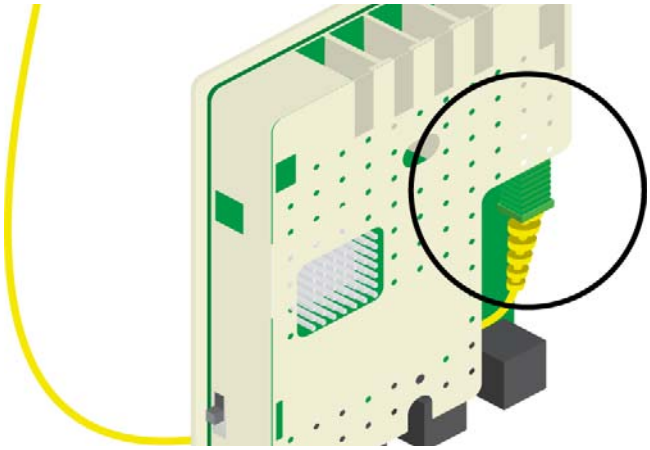
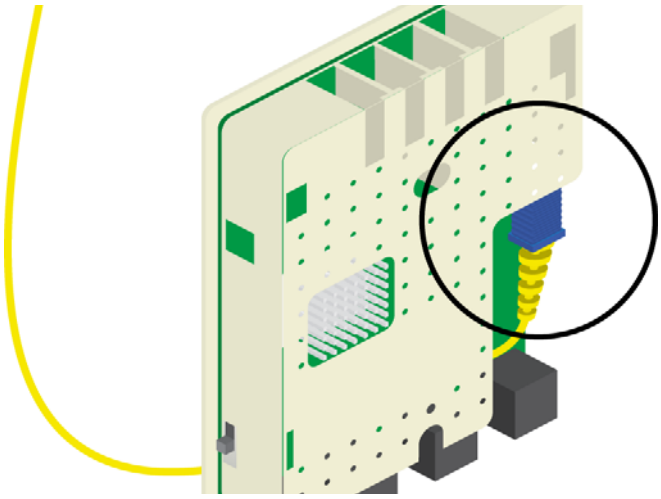


**Figure 26: The zNID-GE-2800 models use fiber with an SC/UPC connector (blue)**



**Note:** To function properly the optical strength to the zNID should be between -8dBm and -28 dBm for GPON and between -2dBm and -23dBm for GE units. See page 54 for information.

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