
CAMBRIDGE

Industries (Group) Co Ltd.

CIG

ONT TA334RG
Hardware Installation Manual

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About This Document

Purpose

This guide describes how to install the ADTRAN optical network termination unit (ONT) at the customer premises.

Intended Audience

This document is intended for technicians responsible for:

- Unpacking and mounting the ONT and power supply
- Connecting the ONT to the PON network
- Connecting services to the ONT

Chapter Overview

This manual is organized as follows:

Chapter 1: Product Description

Provides an introduction to the ONT including physical, electrical, environmental and optical specifications. Compliance information is also provided.

Chapter 2: Safety

Provides electrical, electrostatic, and laser safety information; fiber optic cable handling techniques are also discussed.

Chapter 3: Installing the ONT

Describes installation procedures including site preparation, unpacking and mounting the ONT, connecting power and fiber optic and cables, connecting service cables, activating the ONT, and verifying the installation.

Chapter 4: Troubleshooting

Explains ONT LED behavior and provides basic troubleshooting guidelines.

1. Product Description

1.1 Introduction

Optical Network Terminal (ONT) model TA334RG is an ITU-T G.984 compliant device that receives voice, data, and video traffic in the form of optical signal from the service provider's passive optical network (PON) and transmits it to the desired format at residential or business premises.

Upstream traffic is likewise transmitted to the PON network via the fiber optic cable. A single optical fiber carries both upstream and downstream traffic.

1.2 Services

ONT TA334RG is equipped with ITU-T G.984 compliant 2.5G Downstream and 1.25G Upstream GPON UPLINK interface, and the following service ports¹:

- Four 10/100/1000 Base-T Ethernet ports for high speed internet access and IPTV/VOD services
- Two POTS (VoIP) service ports for voice services
- Integrated 802.11b/g/n wireless
- One USB Host ports for file-sharing service
- One Analog Video service port for video broadcast services

ONT TA334RG has built-in capability for remote management like supervision, monitoring, and maintenance.

1.3 Features

The ONT incorporates the following features:

- Single fiber GPON interface with 1244Mbit/s upstream and 2488Mbit/s downstream data rates
- Advanced data features such as VLAN tag manipulation, classification, and filtering.
- Traffic classification and QoS capability
- 3 REN per line
- Multiple voice Codec
- Optional Remote Bandwidth Control function: Premium Service and Basic Service for Video Overlay
- Rich set of LED indications for alarming and maintenance

1.4 Specifications

¹ Some customized models may only provide a subset of service interfaces mentioned in this manual, for example, only four 10/100/1000 Base-T Ethernet ports are provided.

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ONT physical, electrical, optical, and environmental specifications and compliance information are listed in the following tables.

Dimensions	229mm (width) by 174mm (depth) by 41mm (height)(without bracket) 229mm (width) by 174mm (depth) by 49mm (height)(with bracket)
Weight	0.7 KG excluding power adaptor
GPON interface	SC/APC angled optical connector
POTS interface	RJ-11 connector
Ethernet interface	RJ-45 connector

Table 1 Physical specification

Input Power	+12V DC power input
Power Supply	AC power supply with included power adapter
Power Consumption	< 13.34W

Table 2 Electrical specification

Temperature	0 ~ 40° C
Humidity	5 ~ 95% relative humidity

Table 3 Environmental specification

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PON	ITU-T G.984.1, G.984.2, G.984.2 amd1, G.984.3, G.984.4, G.983.2
EMC	ETSI EN 300386, EN 55022 (Class B)
Safety	EN 60950
Laser	<ul style="list-style-type: none"> ● ITU-T Rec.G.984.2 (Class B+), G983.3 ● FCC 47 CFR Part 15, Class B ● FDA 21 CFR 1040.10 and 1040.11, Class I ● IEC 60825, Class I

Table 4 Compliance

	Minimum	Nominal	Maximum	Notes
Transmitter				
Wavelength	1260 nm	1310 nm	1360 nm	
Transmit power	0.5 dBm		+5 dBm	
Digital receiver				
Wavelength	1480 nm	1490 nm	1500 nm	
Sensitivity	-27 dBm			Minimum received power for BER<10 ⁻¹⁰
Overload			-8 dBm	Maximum received power for BER<10 ⁻¹⁰

Table 5 Optical specification

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2. Safety

This device complies with Part 15 of the FCC Rules / Industry Canada licence-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, operations at closer than this distance is not recommended.

Les antennes installées doivent être situées de façon à ce que la population ne puisse y être exposée à une distance de moins de 20 cm. Installer les antennes de façon à ce que le personnel ne puisse approcher à 20 cm ou moins de la position centrale de l'antenne. La FCC des États-Unis stipule que cet appareil doit être en tout temps éloigné d'au moins 20 cm des personnes pendant son fonctionnement.

Region Selection

Limited by local law regulations, version for North America does not have region selection option.

2.1 Basic Requirements

- Install the device in a well-ventilated place that is not directly exposed to sunlight.
- Keep the device dry and prevent the device from coming into contact with other objects during storage, transportation, and operation of the device.

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- Install the device in compliance with the requirements.
- Do not open the device enclosures without permission, but contact the service technician when a problem occurs with the device.
- No entity or person should modify the structure, security design, performance design, etc. of the device without authorization.
- Abide by local laws and regulations and respect the legal rights of others when using the device.

2.2 Environmental Requirements

- Install the device in a well-ventilated place that is not directly exposed to sunlight.
- Keep the device clean.
- Keep the device away from water sources or wet places.
- Do not place any objects on top of the device. This is to protect the device from damage, such as overheating or melting, which can be caused by those objects.
- Leave a space of at least 50mm around the device for heat dissipation.
- Leave a space of at least 100mm on the top of the device for heat dissipation.
- Keep the device away from heat sources or fire sources, such as electric heaters and candles.
- Keep the device away from electrical appliances with strong magnetic fields or strong electric fields, such as microwave ovens, refrigerators, and mobile phones.
- Do not store the device in an environment where there are corrosive chemicals.

2.3 Electrical Safety

- Use the accessories delivered with the device, such as the power adapter, battery, etc..
- The power supply voltage and current of the device must meet the requirements on the input voltage and current of the device, and provide current overload protection.
- Do not connect the POTS port to an external PSTN line, to prevent damage to the device or cause other safety issues.
- Keep the power plug clean and dry to avoid electric shock or other hazards.
- Follow the insulation requirements of operational safety, for example, keep your hands dry, use insulated tools, etc., when plugging in the device's cables.
- Stop operation of the device and switch off the power before removing or inserting cables.
- Switch off the power and remove all the cables from the device during periods of lightning activity, including the power cable, optical fibers, and network cables.
- Switch off the power and remove the power plug if the device needs to be shut down for a long period of time.
- Protect the device from water or other liquids. If such an incident occurs, switch off the power immediately and remove all the cables from the device, including the power cable, optical fibers, and network cables. Contact the service technician in the event of a device failure.
- Do not step on, pull, drag, or excessively bend the cables because they may become damaged. Damaged cables can cause a device failure.
- Do not use cables that are damaged or have deteriorated.

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2.4 Laser Safety

- Persons handling fiber optic cables must be trained for laser safety.
- Do not bend the fiber optic cable to a diameter smaller than 7.5 cm/3 inches, so as not to damage the fiber or prevent the signal from passing through properly.
- Do not look directly into the optical port on the device without eye protection. The laser emitted from the optical port can cause injury to your eyes.

2.5 Instructions for Cleaning

- Before cleaning the device, stop operation of the device, switch off the power, and remove all cables from the device, including the power cable, optical fibers, network cables, etc. When inserting and removing optical fibers, keep the optical fiber connectors clean.
- When cleaning the device, do not use liquids such as cleaning fluid or spray-on detergents to clean the outer case of the device. Use a soft, dry cloth instead.

2.6 Other Instructions

- In case of any abnormalities, such as smoke, abnormal sound, or odor, being emitted from the device, immediately stop operation of the device, switch off the power, and remove all cables, from the device, including the power cable, optical fibers, and network cables. Contact the service technician in the event of a device failure.
- Prevent foreign objects such as metal objects from falling into the device through the heat dissipation mesh.
- Protect the outer case of the device from scratches, as paint that peels off the scratched areas can cause device abnormalities. If the paint falls into the device it may cause short circuits. In addition, peeled-off paint can cause an allergic reaction in the human body.
- Ensure that the device is kept out of the reach of children. Guard against risks such as children playing with the device or swallowing small parts of the device.

2.7 Instructions for Environment Protection

- Deposit the used devices and batteries at the specified recycling facility.
- Abide by local laws and regulations when handling and disposing of packaging materials, dead batteries and used devices.

Disclaimer

Please read and follow all safety instructions and warnings marked on the outside of the product and its packaging, as well as all the safety instructions outlined in this manual when using this product. Once this product is installed and used, it is the responsibility of the user to know and understand how to safely use this product as described. The user shall bear the loss and/or any liability resulting from a violation of the safety instructions. The equipment manufacturers are not liable for any direct, indirect, incidental, special, consequential or punitive damages.

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3. Installation

3.1 Site Preparation

3.1.1 Environmental Requirements

The ONT will operate in temperatures ranging from 0° C to 40° C, relatively humidity ranging from 5% to 95%.

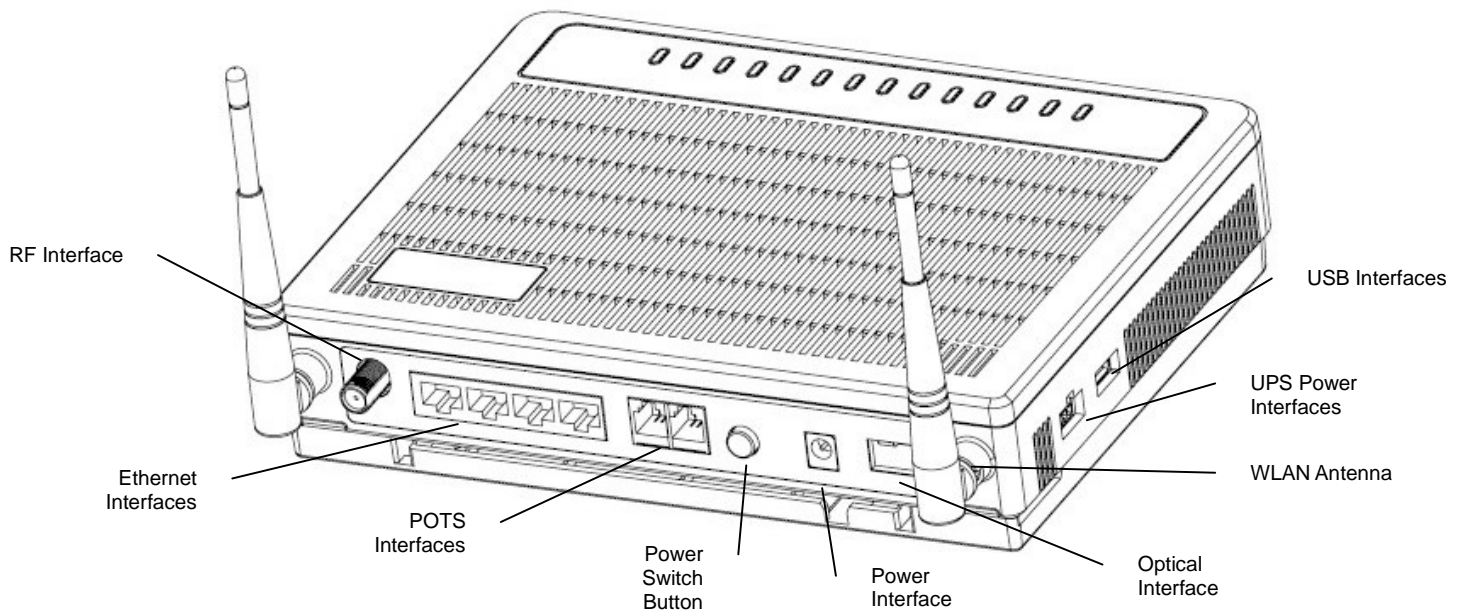
3.1.2 Power Requirements

The ONT will be shipped with a universal power adaptor. However, before installation, check if the AC power input matches the specification printed on the power adaptor (input voltage, current, etc.)

CAUTION: Please use the power adaptor within the package only, or the replacement unit that provided by ADTRAN. Other power adaptor may cause damage to the ONT and other disasters.

3.2 Get to Know the ONT

Look through the diagram below for getting an overview of several parts of the ONT.



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Figure 1 ONT Elements

3.3 Mountings & Connecting to Network

3.3.1 Installing the ONT on Wall

1. Locate a safe and accessible site for installation.
2. Align the ONT mounting bracket on the wall. There are two mounting directions, either horizontal (Figure) or vertical (Figure). Make sure the install arrows is up when correctly mounted.

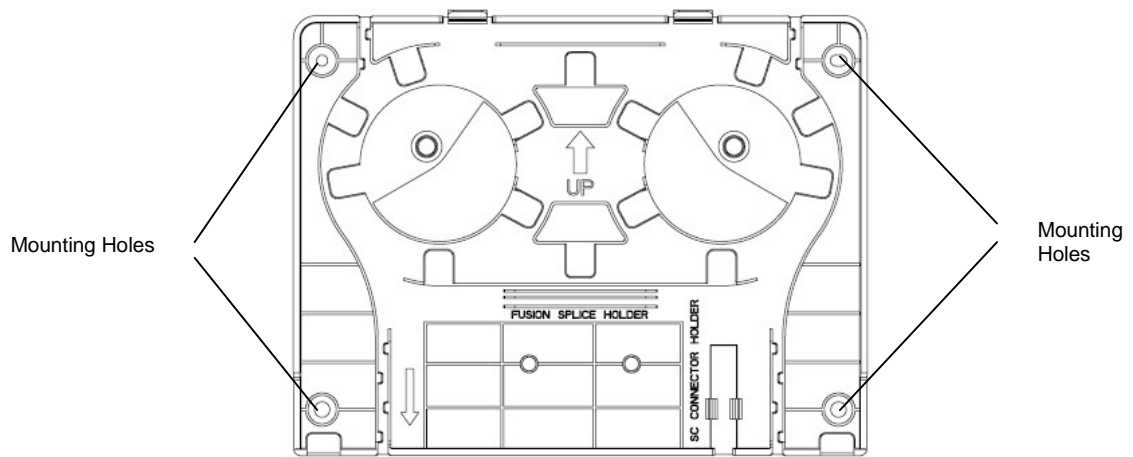


Figure 3 Bracket mounting: Horizontal direction

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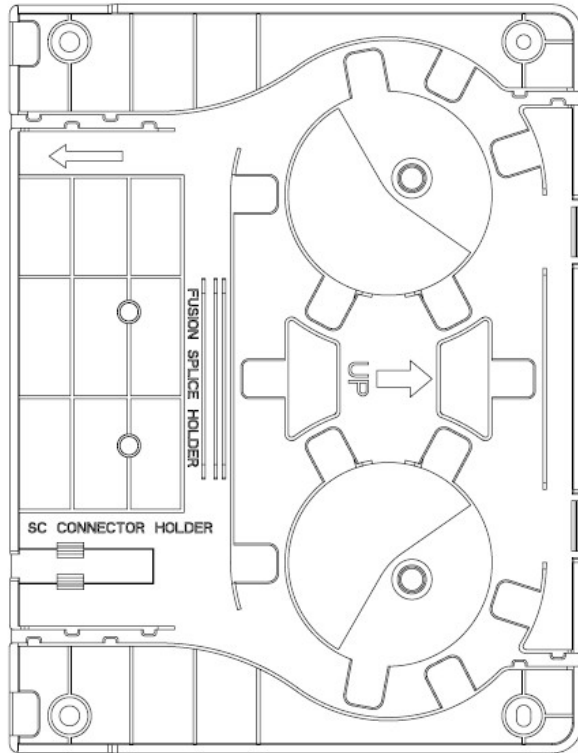
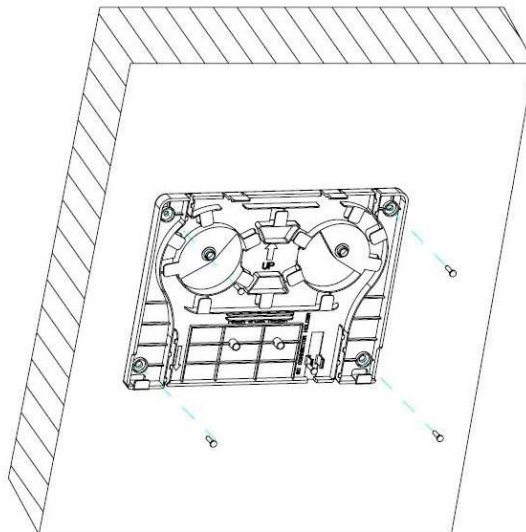


Figure 4 Bracket mounting: Vertical direction

3. Mount the bracket into a wall stud by driving the two sheet metal screws into the wall through the bracket mounting holes (Figure).



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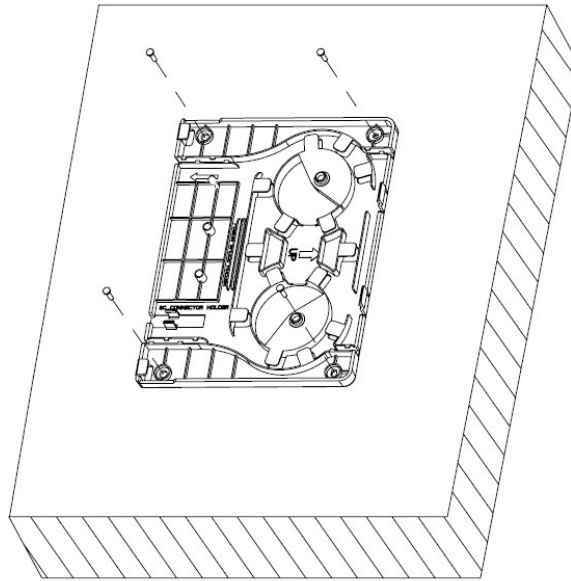


Figure 5 Mount the bracket into the wall

4. Wrap the fiber optical cable on the fiber storage tray. Make sure the SC/APC connector comes out from the bottom left side in case of horizontal mounting, or left up side in case of vertical mounting. Secure the fiber with the cable holder.
5. Slide the ONT unit into the mounting bracket in up to down direction, using the 4 guides on the bracket. Make sure the panel with the interfaces is facing down in case of horizontal mounting, or facing left in case vertical mounting.
6. Remove the dust covers from the SC/APC optical connectors. Clean the connector if necessary.
7. Plug in the fiber connector to connect the ONT to the network.

3.3.2 Installing the ONT on Desktop

1. Locate a safe and accessible site for installation.
2. Place the ONT unit on the desk.
3. Remove the dust covers from the SC/APC optical connector. Clean the connectors if necessary.
4. Plug in the fiber connector to connect the ONT to the network.

3.3.3 Uninstalling the ONT

For uninstal the ONT on the wall:

1. Plug out the SC/APC optical connector.
2. If necessary, slide the ONT unit out of the mounting bracket in down to up direction.

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3. If necessary, remove the optical fiber cables.
4. If necessary, remove the bracket mounting screws and then remove the mounting bracket.

For uninstal the ONT on the desktop:

1. Plug out the SC/APC optical connector.
2. If necessary, remove the optical fiber cables.

3.4 Connecting Power

1. Plug the circle two pin 12V DC power connector of power converter to ONT power port
2. Plug the input of power converter into a live AC outlet
3. Verify that the power (POWER) LED on the ONT is lit green indicating that local power is on and voltage is good.

3.5 Connecting Telephone (POTS) Service

1. Locate the premises' telephone wire pair.
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 ONT RJ-11 phone jacks.
4. Repeat step 2-3 as needed to connect additional phone lines.

Pin	Signal	Pin	Signal
1	Unused	3	Tip
2	Ring	4	Unused

Table 6 POTS RJ-11 connector wiring pattern

DANGER: Please make sure the wire pair connected is from/to the telephone. Using the wire pair from/to the PSTN network falsely may cause damage to user and the device.

3.6 Connecting Ethernet Service

1. Locate the premises' Ethernet LAN cable.
2. If the cable is not terminated, follow local practices to attach an RJ-45 connector. Table shows Ethernet RJ-45 connector wiring information.
3. Plug the Ethernet cable into the ONT RJ-45 Ethernet port.
4. Repeat step 2-3 as needed to connect additional Ethernet cables.

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Pin	Color	Signal	Pin	Color	Signal
1	Orange/White	TX_D1+	5	Blue/White	BI_D3-
2	Orange	TX_D1-	6	Green	RX_D2-
3	Green/White	RX_D2+	7	Brown/White	BI_D4+
4	Blue	BI_D3+	8	Brown	BI_D4-

Table 7 Ethernet RJ-45 connector wiring pattern

3.7 Connecting Analog Video Service

1. Locate the premises' coax video cable.
2. If the cable is not terminated, follow local practices to attach a 75 Ohm type F coaxial connector.
3. Plug the video cable into the ONT Analog Video port.

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3.8 Verifying the Installation

Check LED states to verify ONT status (Section 3.8.1).

Services are not available until the ONT is ranged and provisioned in the PON network. If services must be verified at the time of installation, refer to Section 3.8.2 for additional instructions.

3.8.1 Activating the ONT

Once the ONT installation is complete, follow the procedure below for verifying ONT status. Figures below shows the typical status LED display after the ONT boot sequence is complete.

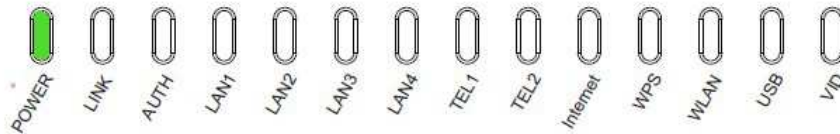


Figure 2 ONT has not yet been provisioned

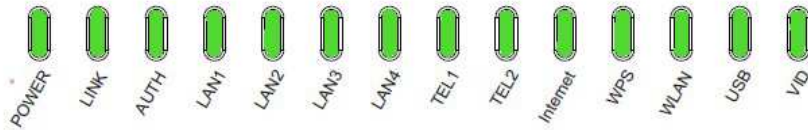


Figure 3 ONT has already been provisioned

- Verify that the POWER LED light is green, indicating that local power level is good.
- Verify that the LINK LED light is green, indicating that the ONT is operating normally.

The ONT is placed into service remotely through the OLT. Services to the ONT are likewise provisioned and turned up remotely through the PON network.

- If the LINK LED lights green, indicating that the ONT is communicating with the PON network, no further activation is necessary and you can proceed to Section 3.8.2: Verifying Services.
- If the LINK LED does not light green, contact the NOC (Network Operation Center) to activate the line. You may be required to provide or confirm the following information about the ONT: vendor, model number, serial number. Once the ONT has been activated in the network, and the LINK LED is lit green, you can proceed to Section 3.8.2: Verifying Services.

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3.8.2 Verifying Services

Follow local practices to connect to each active service port in the ONT to confirm service activation.

1. If VID service is included in this installation, verify the VID LED is green.
2. Connect to each active phone jack to verify telephone numbers and services. Verify that the TEL LED lights green when a line is off hook.
3. If Ethernet service is included in this installation, confirm that data is being received and transmitted normally. The LAN LED will be flashed during data transmission.
4. If WLAN service is included in this installation, confirm that data is being received and transmitted on WLAN interface. Verify the WLAN LED is green when the WLAN is connected.

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4. Troubleshooting

4.1 ONT Status LEDs

The ONT status LEDs located on the enclosure (Figure 4) assist with installation and maintenance procedures. These LEDs are described in detail in Table .

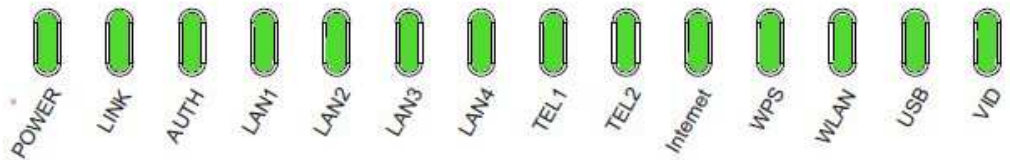


Figure 4 ONT Status LEDs location

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LED Name	Color	Indicates
POWER	Green/Solid	Normal.
	OFF	No power
LINK	Green/Solid	Optical link is OK
	OFF	Optical link is NOT OK
AUTH	Green/Solid	ONU is authorized (O5)
	Green/Flash	ONU is registering (O2->O5)
	OFF	ONU is NOT authorized (O1 or O7)
LAN1	OFF	Link down
	Green/Flash	Active(Tx and/or Rx)
	Green/Solid	Link up
LAN2	OFF	Link down
	Green/Flash	Active(Tx and/or Rx)
	Green/Solid	Link up
LAN3	OFF	Link down
	Green/Flash	Active(Tx and/or Rx)
	Green/Solid	Link up
LAN4	OFF	Link down
	Green/Flash	Active(Tx and/or Rx)
	Green/Solid	Link up
TEL1	Green/Solid	ONT register to SS and on hook
	Green/Flash	Off hook(on register) or Call in
	OFF	No register

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LED Name	Color	Indicates
TEL2	Green/Solid	ONT register to SS and on hook
	Green/Flash	Off hook(on register) or Call in
	OFF	No register
INTERNET	Green/Solid	Indicate PPPoE / DHCP signup completed successfully. Internet is connected
	Green/Flash	Indicate to be getting IP with PPPoE/DHCP
	OFF	Indicate WAN is not configured
WPS	Green/Solid	"Success" status
	Yellow/Flash	"In Progress" status
	Red/Flash	"Error" and "Session Overlap" status
	OFF	WPS disable
WLAN	Green/Solid	Connected
	Green/Flash	data receive and transfer
	OFF	Error/WLAN is not connected/WLAN disable
USB	Green/Solid	Connected
	Green/Flash	data receive and transfer
	OFF	No power/error/USB is not connected/USB disable
VID	Green/Solid	The received optical signal power level is above the prescribed limit
	Green/Flash	Indicates premium service enabled
	OFF	Indicates that the Video optical band being received by the ONT/ONU is lower a prescribed limit.

Table 8 ONT Status LEDs description

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4.2 Troubleshooting Procedures

Problem	Possible Solutions
The POWER LED is off	Check whether the ON/OFF button on the rear „ panel is pressed.
	Check whether the power adapter matches the TA334RG.
	Check whether the power connection is correct.
The LINK LED is off	Check whether the optical fiber is connected correctly.
	Check whether there is dirt on the optical connector.
The LINK LED is on, but the INTERNET LED is off.	The TA334RG may not receive the downstream optical signal sent by the service provider. Contact the service provider for help.
The LAN LED is off	Check whether the Ethernet cable delivered with the device is used.
	Check whether the Ethernet cable is connected correctly.
	Check whether the indicator of the network adapter is on.
	Check whether the network adapter works normally: Check whether there are devices with the ? or ! mark under Network adapters. If there are such devices, uninstall and then re-install them, or insert the network adapter into another slot. If the problem remains, change the network adapter.
The TEL LED is off	Check whether the connection of the telephone cable is correct
	Check whether the telephone is onhook.
The Internet LED is off	Check if WAN port is configured correctly

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The WPS LED is off	Check whether the WPS service is started.
The WLAN LED is off	Check whether the WLAN service is started.
The USB LED is off	Check whether the cable is normal.
The VID LED is off	Video power level is low, or video service is disabled. Contact NOC for verification.

Table 9 Troubleshoot procedures

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