# GR241AG
## Fiber Gateway 4x4

**GPON CPE Solution**

## Description

Targeted to PON FTTH deployment scenarios, this compact multi-play Fiber Gateway (FGW) features services such as High-Speed Internet, VoIP, IPTV, and RF Overlay, being the right choice for Operators and Service Providers that want to deliver multiple and advanced services to residential clients.
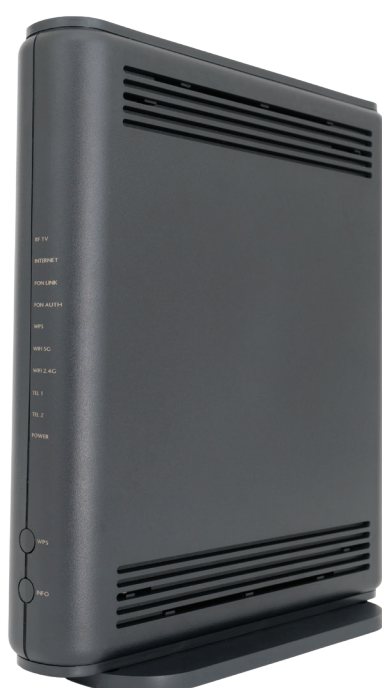
The architecture of this FGW is based on the ITU G.984.x recommendations, supporting full in-house multi-play services, enabling Data, Voice, and Video services through Ethernet, Wi-Fi, FXS, USB, and RF Overlay standard interfaces. Four built-in RJ-45 10/100/1000Base-T ports connect devices via cable, complementing ultra-fast Wi-Fi access for Internet applications such as video, email, web surfing, file upload/download, and online gaming. Two RJ-11FXS ports connect voice or fax devices featuring the SIP protocol. A valuable set of built-in LEDs provides fast and pertinent information to the user or the installer.

This FGW includes a high-performance Wi-Fi technology that supports dual-band concurrent operation, complying with 802.11a/b/g/n/ac standards, operating simultaneously on the 2.4GHz and 5GHz frequency bands. DFS (Dynamic Frequency Selection) techniques allow an increase in air interface throughput and range, mitigating multi-user interference.

This FGW is fully interoperable with 3rd party OLTs. The device can be remotely managed and configured, allowing operators to optimize OPEX and scale-up deployments by featuring auto-provisioning mechanisms (e.g., TR-069, OMCI, and DHCP).

### Business Benefits

- Compact, high-speed and low-power consumption device for residential clients;

- Multi-play services including Data, High-Speed Internet (HSI), VoIP, and TV (IPTV and RF Overlay);

- Evolution of the broadband access paradigm up to 2.5Gbps/1.25Gbps (downstream/upstream) data rates;

- Dual-band concurrent Wi-Fi, complying with 802.11 a/b/g/n/ac standards, operating simultaneously on the 2.4GHz and 5GHz frequency bands;

- Multi-vendor OLT interoperability;

- Mass remote management through OMCI (G.984.4 and G.988) and TR-069 standards, thus offering full remote control without user intervention.
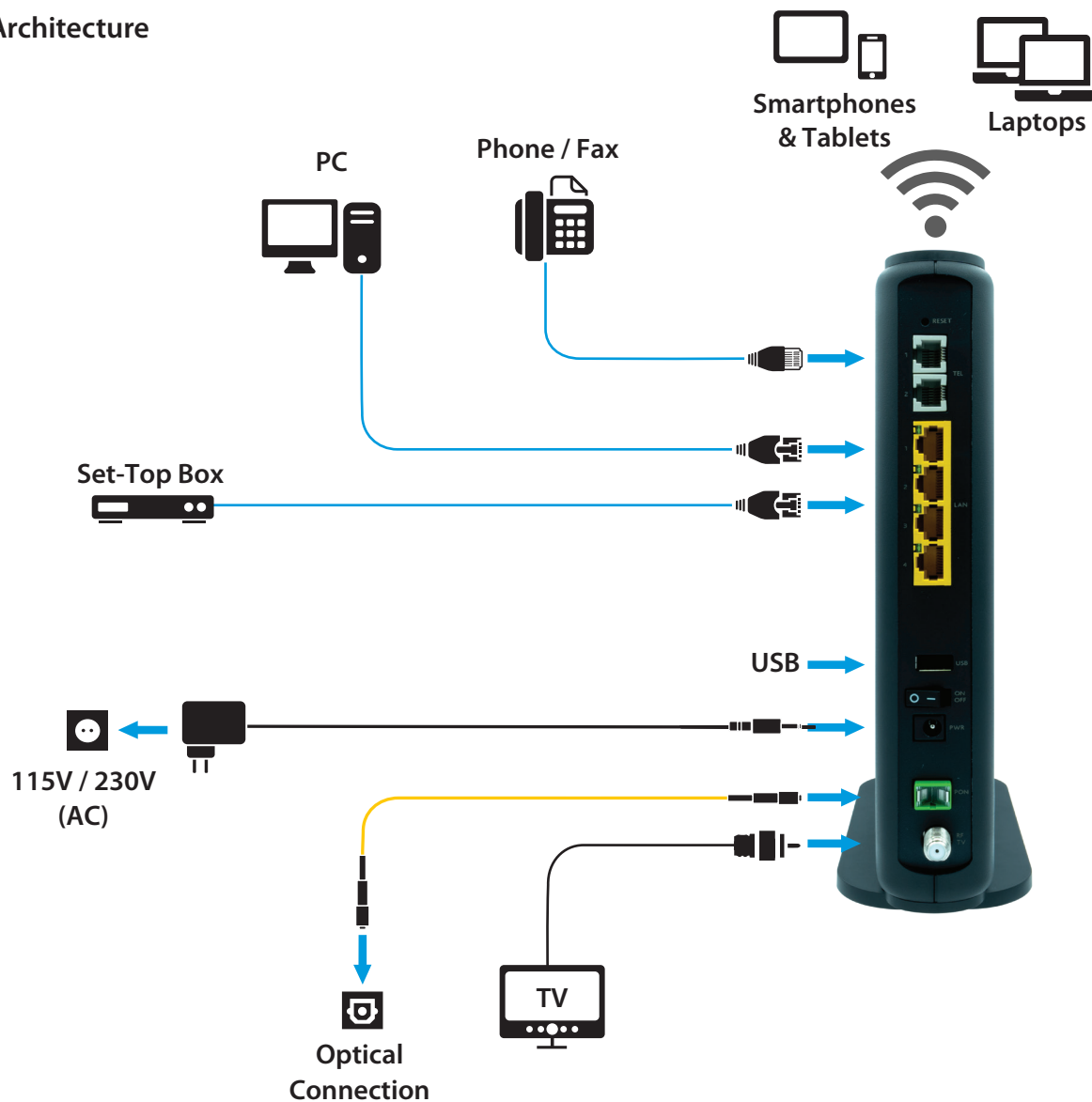
Front view

Rear view

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## Architecture

**PC**

**Phone / Fax**

**Smartphones & Tablets**

**Laptops**

**Set-Top Box**

**USB**

**115V / 230V (AC)**

**Optical Connection**

**TV**

## ONT Fiber Gateway 4x4 Configurations

| | |
|---|---|
| **RF Overlay** | 1xCATV |
| **Wi-Fi 2.4GHz 802.11b/g/n** **Wi-Fi 5GHz 802.11ac** | 2.4GHz @ 3x3 5GHz @ 4x4 Dual concurrent |
| **USB 2.0** | 1 |
| **FXS Ports** | 2 |
| **ETH Ports** | 4x 10/100/1000Base-T |
| **NAT/NAPT** | ✓ |
| **Firewall** | ✓ |
| **VPN pass-through** | ✓ |
| **PPPoE termination** | ✓ |
| **OMCI** | ✓ |
| **TR-069** | ✓ |
| **CLI** | ✓ |
| **WebGUI** | ✓ |

## Specifications

| WAN Uplink Interfaces | G.984.2 GPON and Active Ethernet |
|---|---|
| **GPON layer per G984.x** | Compliant with GPON standards: ITU-T G.984.1 /G.984.2 /G.984.3 /G.984.4 /G.984.5 /G.988;<br>GPON Encapsulation Method (GEM) supports Ethernet;<br>Configurable AES (Downstream) and FEC (Downstream and Upstream);<br>Bitrates: 2.488Gbps (Downstream) /1.244Gbps (Upstream);<br>Support ODN loss up to 32dB;<br>T-CONTs: 32;<br>GEM Port-IDs: 255. |
| **L2/L3 layer** | VLAN-ID to GEM port-ID mapping (per TR-156i3):<br>   1:1, N:1 VLAN;<br>Transparent VLAN;<br>Classification: DSCP/TOS, 802.1p TCI, VLAN-ID, MAC address;<br>Traffic Management: up to 8 queues per T-CONT in priority-controlled mode or up to 16 queues per T-CONT in rate-controlled scheduling mode;<br>802.1q VLAN processing: Q-in-Q, tagging, removing tag, replacing tag or transparent forwarding;<br>IPv4; IPv6;<br>Routing: Network Access Translation (NAT) and Network Access Port Translation (NAPT);<br>Firewall; VPN;<br>DHCP Client and Server;<br>PPPoE Client;<br>Performance: 1000Mbps bidirectional;<br>Quality of Service (QoS) prioritization using 802.1p. |
| **IPTV** | IGMP v2/v3, and MLD (IPv6) snooping and proxy;<br>IGMP processing per VLAN ID to support group of channels;<br>Interactive services (Video On Demand);<br>IPTV streams forwarding simultaneous :128. |
| **VoIP specifications** | Call control: SIPv1/v2; T.38 Fax relay; Fax/Data bypass;<br>Echo canceller; Echo canceller length; Jitter buffer;<br>Caller ID generation; G.711 PCMU;<br>G.711 PCMA; G.723.1; G.726;<br>G.729; VAD and CNG; Caller ID and call waiting;<br>RTP/RTCP packet encapsulation; RFC 2833 Support;<br>In-band signaling detection and generation (DTMF, call progress tones);<br>Automatic Tone generation (dial, busy, ring back, stutter, distinctive ring); 3-Way conferencing. |
| **Services** | Content sharing:<br>  - UPnP Media Server;<br>  - DLNA DMS;<br>  - Metadata Support;<br>OSGI (Open Service Gateway Interface). |
| **WiFi** | Functionalities:<br>  - 802.1x authentication; External RADIUS authentication;<br>  - WPA/WPA2; 64/128 Bits WEP;<br>  - AES and TKIP Encryption;<br>  - Wi-Fi multimedia support: WMM and WMM-PS;<br>  - Multiple SSIDs;<br>  - MAC address filtering integrated;<br>  - WPS (Pushbutton and PIN entry);<br>  - Hotspot 2.0;<br>  - Band steering. |

For the WiFi section, the Interfaces sub-table:

| Interfaces: | Power |
|---|---|
| - Concurrent Mode 2.4GHz + 5GHz via internal antennas | |
| - 2.4GHz: Compliant with IEEE 802.11b/g/n with 3x3 MIMO | Up to 20dBm EIRP |
| - 5GHz: Compliant with IEEE 802.11a/n/ac and with 4x4 MIMO | Up to 30dBm EIRP |

   - Channel Bandwidth: 20, 40, 80, 80+80, 160

   - Support of zero wait Dynamic Frequency Selection (DFS): 4x4 with weather radar detection

   - Multi-User MIMO for better performance per user

Data rates:
    802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
    802.11b: 1, 2, 5.5, 11 Mbps
    802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps
    802.11n: up to 600 Mbps
    802.11ac: up to 3400 Mbps
    1024QAM (2.4GHz) : up to 1000 Mbps
    1024QAM (5GHz) : up to 2166 Mbps

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| | |
|---|---|
| **RF Overlay** | 1 port on an F Type Connector;<br>75 ohms impedance (nominal);<br>Optical wavelength: 1550nm;<br>Optical power: -8dBm < Pin < +2dBm;<br>Analog bandwidth:  minimum 47 MHz and maximum 870MHz (maximum can be extended up to 1002MHz on different variants). |
| **POTS** | RJ-11 FXS port |
| **USB** | USB 2.0 Host |
| **Management** | Web-based with GUI;<br>Remote management through OMCI, PLOAM, OAM and Connected Home:<br>TR-069/098/104/111/140/142/143/181<br>Secure software download upgrade via OMCI or TR-069;<br>Embedded Telnet server for remote management;<br>SNMP V3; Zero-touch configuration; CLI. |
| **LAN Ethernet interfaces** | RJ-45 10/100/1000Base-T;  Auto-negotiation support;  Auto MDI/MDIX support. |
| **Energy Efficiency** | CoCV6 |
| **Environment** | Temperature Range: +5ºC to +40ºC<br>Relative Humidity: 5% to 95% |
| **EMC** | ETSI EN 301489-1 and EN 301489-17 |
| **Safety** | ETSI EN 60950-1 |
| **Radio** | ETSI EN 300328 and EN 301893 |
| **Equipment Size (HxWxD)** | 245.8 x 44.8 (80.6 including base) x  210.0mm / 9.7 x 1.8 (3.2 including base) x 8.3" |
| **Net Weight** | 834g / 1.84lb |
| **Power Supply** [1] | Primary: 230VAC, 50Hz or 115VAC, 60Hz;<br>Secondary: 12VDC/3A ± 15% |

[1] An LPS power source is used to power the ONT equipment:

- US/Canada: The ONT must be powered by an external Listed Limited Power Source (LPS) or Class 2 Power source. The external power adapter must be LPS certified.

- Rest of the World: The ONT must be powered by an External CB approved  Limited Power Source (LPS).

## altice labs