



# FWA7 Root Plus & Leaf Plus

## MLO-Enabled PTMP Solution

Zyxel's MLO-enabled PTMP solution unifies Multi-Link WiFi 7, Smart Antenna, Dynamic Time-Based Resource Management, Smart Rate Limits, and Nebula Cloud Management in one platform. It delivers reliable multi-gigabit performance with lower overhead, giving WISPs a competitive edge.

### Solving key WISP challenges

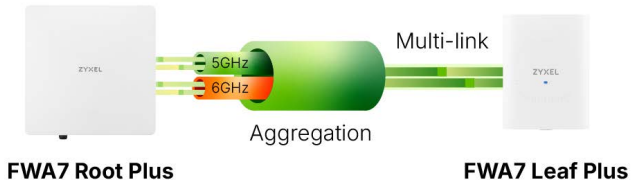
- Deliver multi-gig services without fiber builds
- Maintain service continuity under interference or partial link loss
- Simplify operations with cloud-based zero-touch provisioning and monitoring
- Maximize spectrum use in dense or high-traffic deployments
- Enforce fair bandwidth policies with Smart Rate Limits

## Benefits

### WiFi 7 Multi-Link Operation (MLO)

5GHz & 6GHz aggregation

WiFi 7 MLO combines 5GHz & 6GHz channels for faster, more resilient links. Each subscriber gets up to 4.4 Gbps*, with sector capacity up to 7 Gbps*. With built-in failover, WISPs can deliver multi-gig service without fiber.




**WiFi 7 MLO**
5GHz + 6GHz combined for higher speed and reliability

**Dynamic Time-Based Resource Management**
Adaptive scheduling reduces collisions and keeps latency low

**Smart Antenna**
Dual-beam design for stronger near- and far-field coverage

**Smart Rate Limits**
Fair sharing that controls bandwidth without adding latency

**Nebula Cloud Management**
Zero-touch setup, remote monitoring, and open APIs

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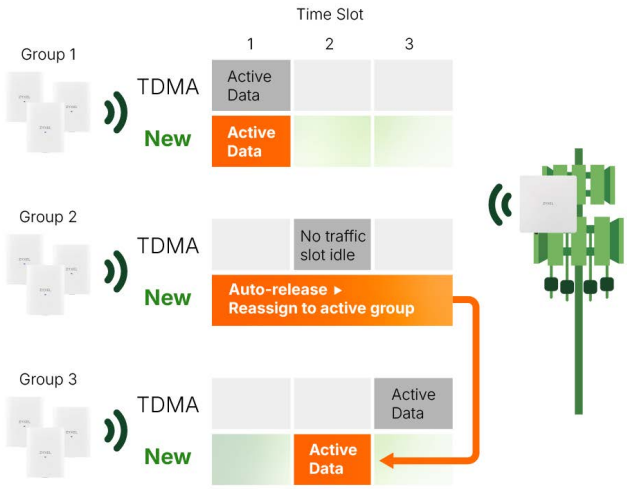
Datasheet FWA7 Root Plus & Leaf Plus

## Dynamic Time-Based Resource Management

### Lower latency, higher efficiency

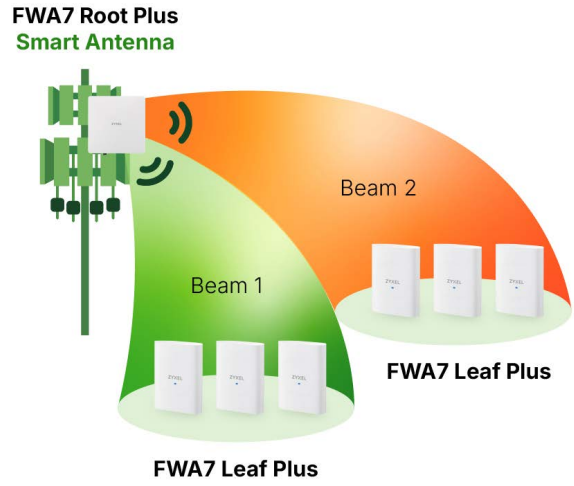
This feature dynamically allocates airtime slots in real time to reduce collisions and maximize efficiency. It lowers latency and stabilizes throughput in dense or long-range PTMP deployments — delivering smoother user experiences and greater sector capacity.




## Smart Antenna

### Near- and far-field coverage

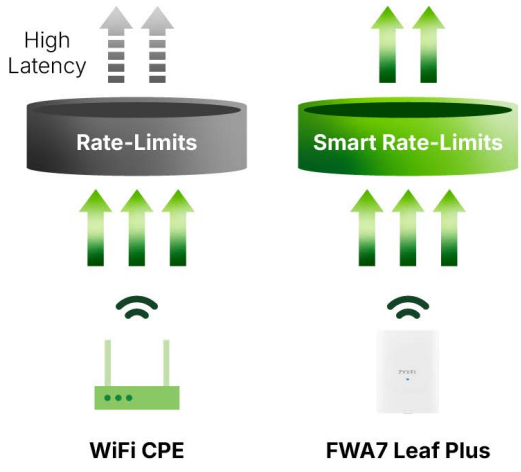
This technology uses dual-beam geometry to optimize coverage for both near- and far-field clients. It delivers stronger link margins, more consistent coverage, extended range, and fewer costly truck rolls from alignment issues.




## Smart Rate Limits

### Dynamic per-packet flow QoS

Traditional rate limits cap bandwidth, causing slower speeds and higher latency once users exceed the limit. Smart Rate Limits keep latency stable even beyond the cap, ensuring fair use, smoother performance, and a better overall user experience.

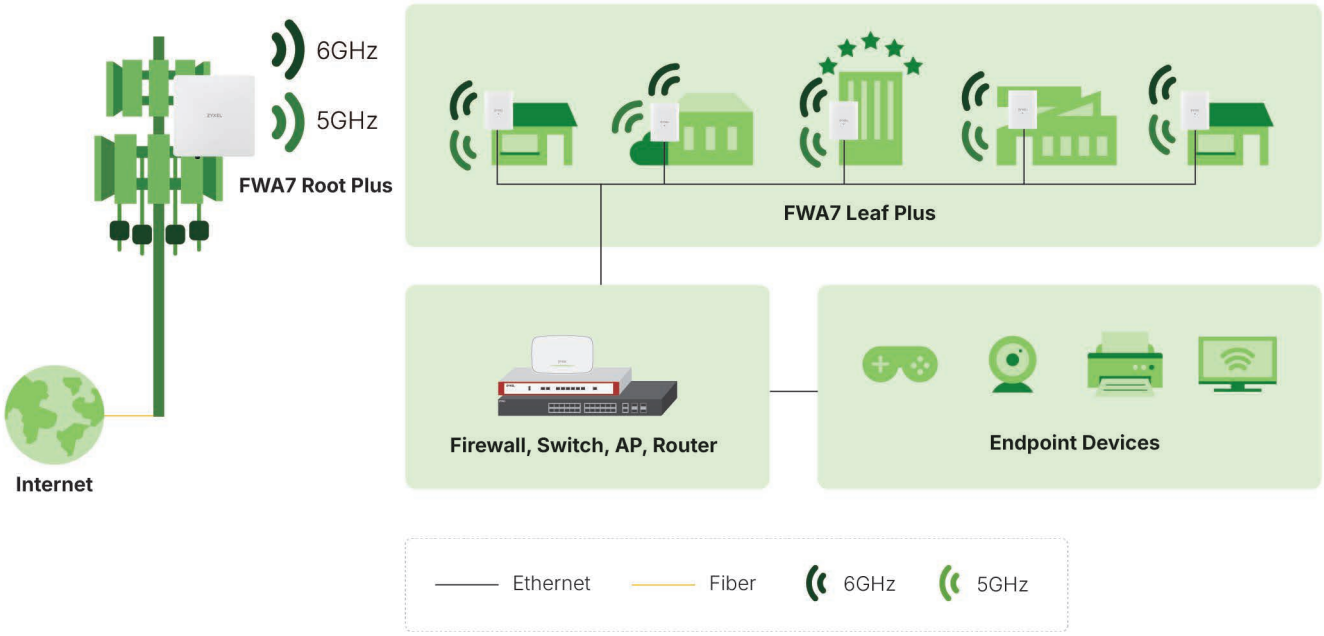



## Nebula Cloud Management

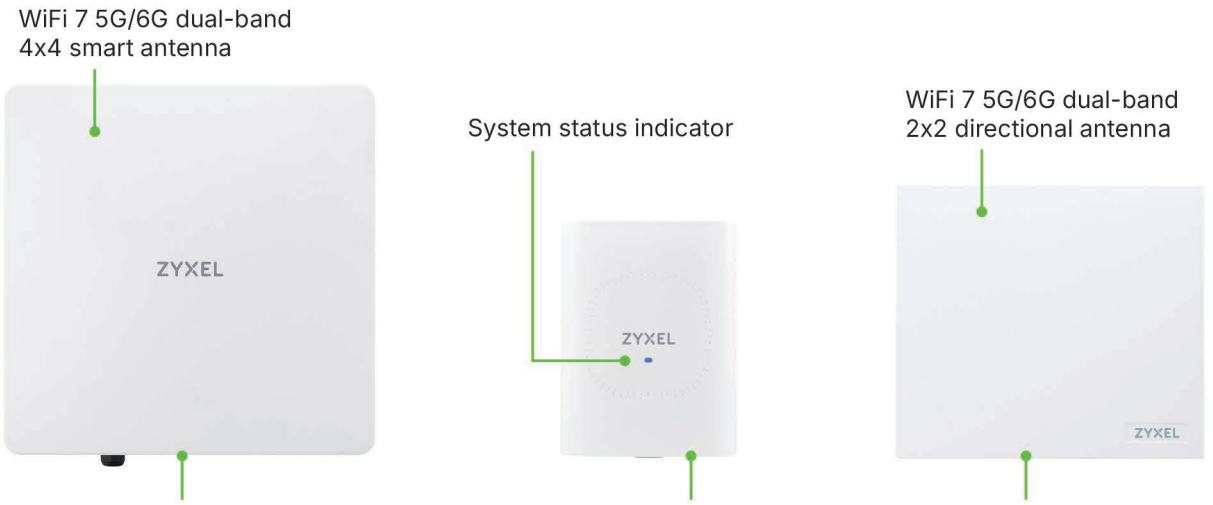
### Zero-touch provisioning & APIs

This platform provides a centralized portal for zero-touch provisioning, remote monitoring, firmware and policy updates, and API integration. It streamlines onboarding and enables automation at scale, helping WISPs reduce truck rolls, cut OPEX, and accelerate deployments.

## Application Diagram




## Interface Description



# Specifications

| Model | | FWA7 Root Plus | FWA7 Leaf Plus |
|---|---|---|---|
| **Product name** | | 802.11be (WiFi 7) 5G/6G 4×4 Dual-Radio PTMP Base Station | 802.11be (WiFi 7) 5G/6G 2×2 Dual-Radio PTMP CPE |
| | |  |  |
| **Wireless** | | | |
| **Standard** | | IEEE 802.11 be | IEEE 802.11 be |
| **MIMO** | | 4×4 MU-MIMO | 2×2 MU-MIMO |
| **Wireless speed** | **5G** | 8646Mbps | 4324Mbps |
| | **6G** | 11530Mbps | 5764Mbps |
| **Frequency band** | **5G** | USA(FCC): 5.15 to 5.36 GHz; 5.471 to 5.850 GHz | USA(FCC): 5.15 to 5.36 GHz; 5.471 to 5.850 GHz |
| | **6G** | USA(FCC): 5.925 to 6.425 GHz; 6.525 to 7.125 GHz | USA(FCC): 5.925 to 6.425 GHz; 6.525 to 7.125 GHz |
| **Bandwidth** | **5G** | 20/40/80/160/240 MHz | 20/40/80/160/240 MHz |
| | **6G** | 20/40/80/160/240/320 MHz | 20/40/80/160/240/320 MHz |
| **Modulation** | | up to 4096 QAM | up to 4096 QAM |
| **RF Design** | | | |
| **Antenna type** | | Sector Smart Antenna | External Antenna |
| **Antenna gain** | **5G** | 15.2 dBi | N/A |
| | **6G** | 14.6 dBi | N/A |
| **HPBW (Azimuth)** | **5G** | 70° | N/A |
| | **6G** | 70° | N/A |
| **HPBW (Elevation)** | **5G** | 17° | N/A |
| | **6G** | 18° | N/A |
| **Minimum Receive sensitivity (dBm per chain)** | **MCS0** | 20MHz: -92, 40Mhz: -89, 80MHz: -86, 160MHz: -83, 320MHz:-80 | 20MHz: -92, 40Mhz: -89, 80MHz: -86, 160MHz: -83, 320MHz:-80 |
| | **MCS7** | 20MHz: -92, 40Mhz: -89, 80MHz: -86, 160MHz: -83, 320MHz:-80 | 20MHz: -92, 40Mhz: -89, 80MHz: -86, 160MHz: -83, 320MHz:-80 |
| | **MCS9** | 20MHz: -68, 40Mhz: -65, 80MHz: -62, 160MHz: -59, 320MHz:-56 | 20MHz: -68, 40Mhz: -65, 80MHz: -62, 160MHz: -59, 320MHz:-56 |
| | **MCS11** | 20MHz: -62, 40Mhz: -59, 80MHz: -56, 160MHz: -53, 320MHz:-50 | 20MHz: -62, 40Mhz: -59, 80MHz: -56, 160MHz: -53, 320MHz:-50 |
| | **MCS13** | 20MHz: -56, 40Mhz: -53, 80MHz: -50, 160MHz: -47, 320MHz:-44 | 20MHz: -56, 40Mhz: -53, 80MHz: -50, 160MHz: -47, 320MHz:-44 |
| **Front to back ratio** | | >20dB | N/A |
| **WLAN Feature** | | | |
| **WDS** | | Yes | Yes |
| **MLO** | | Yes | Yes |
| **AFC** | | Yes | Yes |
| **Dynamic Time-based Resource Management** | | Yes | Yes |

| Model | | FWA7 Root Plus | FWA7 Leaf Plus |
|---|---|---|---|
| **Physical Interface** | | | |
| **Ethernet port** | | 1× 1/2.5/5/10 GbE RJ-45 | 1× 1/2.5 GbE RJ-45 |
| | | 1× 1/10 GbE SFP+ | |
| **Power** | | PoE 802.3bt | PoE 802.3at |
| | | DC-In: 24-48V/2.5A(Terminal Block) | |
| **Surge protection** | | 6KV | 6KV |
| **Antenna connector** | | N/A | 4 ×50 ohm, RP (Reverse Polarity) SMA |
| **GPS** | | L1/L5 | L1/L5 |
| **Physical Specifications** | | | |
| **Dimension (WxDxH)(mm/in.)** | | 410 × 410 × 110 / 16.14 × 16.14 × 4.33 | 180 × 137 × 50 / 7.09 × 5.39 × 1.97<br>incl. wall mount |
| **Item Weight (g/lb)** | | 5130 / 11.31 | 681 / 1.5 |
| **Environmental Specifications** | | | |
| **Temperature** | **Operation** | -40°C to 70°C/-40°F to 158°F | -30°C to 60°C/-22°F to 140°F |
| | **Storage** | -50°C to 80°C/-58°F to 176°F | -40°C to 70°C/-40°F to 158°F |
| **Humidity** | **Operation** | 10% to 95% | 10% to 95% |
| | **Storage** | 10% to 90% | 10% to 90% |
| **IP-rating** | | IP-68 | IP-56 |
| **Wind load** | | 55 m/s | 55 m/s |
| **Software** | | | |
| **Operation mode** | | Bridge | IP-Passthrough/NAT |
| **Smart Rate-Limit** | | Yes | Yes |
| **IP Host** | | IPv4/IPv6 | IPv4/IPv6 |
| **DHCP** | | Client | Server / Client |
| **Management mode** | | Nebula Cloud Management | Nebula Cloud Management |

| Model | | Antennas (ACCESSORY-ZZ0114F) |
|---|---|---|
| **Product name** | | High Gain Directional Antenna for Leaf Plus |
| | |  |
| **RF Design** | | |
| **Support frequency** | **5G** | 5150-5850MHz |
| | **6G** | 5925-7125MHz |
| **Antenna gain** | **5G** | 14.6 dBi |
| | **6G** | 14.6 dBi |
| **HPBW (Azimuth)** | **5G** | 20° |
| | **6G** | 25° |
| **HPBW (Elevation)** | **5G** | 16° |
| | **6G** | 17° |
| **Front to back ratio** | | >15dB |
| **Physical Interface** | | |
| **Antenna connector** | | 4xN-Type Jack |
| **Physical Specifications** | | |
| **Dimension (WxDxH)(mm/in.)** | | 225 × 255 × 33 / 8.86 × 10.04 × 1.30 |
| **Item Weight (g/lb)** | | 793 / 1.75 |

| Model | | Antennas (ACCESSORY-ZZ0114F) |
|---|---|---|
| **Environmental Specifications** | | |
| **Temperature** | **Operation** | -40°C to 70°C/-40°F to 158°F |
| | **Storage** | -50°C to 80°C/-58°F to 176°F |
| **Humidity** | **Operation** | 10% to 95% |
| | **Storage** | 10% to 90% |
| **IP-rating** | | IP-67 |
| **Wind load** | | 55 m/s |

## Nebula License Options

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Nebula provides flexible options to meet your needs, offering complimentary, enhanced, and advanced cloud networking solutions. Your chosen plan determines the level of service you receive from Nebula Cloud.

| Feature Name | Base Pack | Plus Pack | Pro Pack |
|---|---|---|---|
| **Unlimited Registration & Central Management (Configuration, Monitoring, Dashboard, Location Map & Floor Plan Visual) of Nebula Devices** | ● | ● | ● |
| **Over-the-air Firmware Management** | ● | ● | ● |
| **Admin Accounts per Organization (Full Access for Administration Rights)** | 5 | 8 | No Limit |
| **Advanced Firmware Scheduling (Org/Site/Device)** | | ● | ● |
| **Automatic Network Topology (Visual and Actionable)** | | ● | ● |
| **Email users and alert Notifications** | | ● | ● |
| **Organizational User Audit / Change Logs** | | | ● |
| **Backup/Restore Configuration** | | | ● |
| **Priority Nebula Support Request (Direct NCC incl. Web Chat)** | | | ● |

* Search Nebula Control Center for more Nebula license plan.

## Nebula Mobile App


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21/01/26