

## OS-GEMINI INTEGRATED

# High-Reliability Wireless Ethernet Bridge

Your solution for Challenging Non-Line-of-Sight, long range Line-of-Sight and High Multipath Environments

### Which word best defines success in wireless connectivity? Is it *availability*? *Reliability*? How about *speed*?

By any measure, OS-Gemini succeeds where more conventional solutions disappoint. We achieve a far more reliable connection, much more often, and at higher data rates—*because OS-Gemini is designed to work even where others cannot*. Even in supposedly connection-friendly applications, OS-Gemini protects against the transient attenuation, fading and dispersion that degrade *all* wireless signals.

Consider this: 85% of properties 1500 feet apart have no optical Line-of-Sight path between their roofs. For them, a conventional wireless solution won't work 75% of the time. OS-Gemini succeeds over 99% of the time. User data rate for Non-Line-of-Sight links of up to 6 miles in length can be up to 24 Mbps. Maximum data rate is 33.6 Mbps on less obscured links.

OS-Gemini operates over the license-exempt 5.8 GHz band and involves no ongoing expense—so cost of ownership is low.

*That's another definition of success.*

### A Unique Technology Combination

OS-Gemini's success (and therefore yours as well) results from a unique combination of technologies—the overall effect of which is much more powerful than using any of them individually. You can acquire this combination in a surprisingly small form factor that is easy to install and maintain, even in aesthetically or physically restrictive environments. These technologies include:

**Multi-beam Space/Time Encoding** OS-Gemini radiates multiple beams from the antenna—the effect of which is to significantly protect against fading and to radically increase the probability that the receiver will decode a useable signal.

**Best-In-Class Radio** A powerful transmitter combined with a super-sensitive receiver delivers a class-leading 167dB system gain. This is 25 times better than the performance of our closest competitor.

**OFDM (Orthogonal Frequency Division Modulation)** OFDM is now the industry-recognized method of reducing interference caused by signals that take multiple paths arriving out of phase at the receiver. OS-Gemini takes this technology further by using more sub-carriers and pilot tones than our

nearest competitors. This provides the class-leading capability in handling multipath dispersion and provides instant fade recovery.

**Dynamic Frequency Selection** At power-up and during operation, OS-Gemini scans the whole band and automatically switches to the clearest channel. This is “licensed band interference-free performance in an unlicensed band!”

**Adaptive Modulation** Transmitter and receiver negotiate the highest mutually sustainable data rate—then dynamically “upshift” and “downshift” the rate as conditions change. OS-Gemini always provides the maximum performance possible within the current power limits.

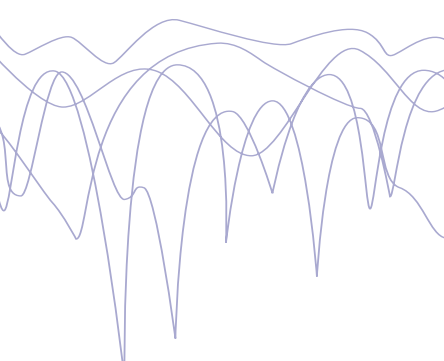
### Power Up and Point

OS-Gemini is easy to install and automatically selects the clearest channel, modulation scheme and transmit power for the link. A link comprises two outdoor units and two indoor units complete with the required mounting kit. Large antenna beamwidth simplifies the initial connection and an audio tone assists the installer to optimize link alignment. The indoor unit (about the size of a pocket dictionary) connects to power and your LAN. The small outdoor unit is a neutral color, making it ideal for aesthetically restrictive areas.

### Low Cost of Ownership

OS-Gemini is usually the lower-cost option, especially when you consider:

- The cost of leased-line alternatives
- Business impacts from unavailable, unreliable or slow wireless alternatives
- Remote upgrade, management and maintenance are easy (and protect your investment) thanks to the software-based radio
- Effects of relocations, foliage growth or building construction activities



## Technical Specifications for the OS-Gemini Integrated

| Radio Technology                                | Remarks  |
|---|--|
| RF band   | 5.725 GHz–5.850 GHz (ISM)  |
| Channel size                                    | 12 MHz   |
| Channel selection/<br>Dynamic frequency control | By Dynamic Frequency Selection (DFS) or manual intervention; automatic detection on start-up and continual adaptation to avoid interference                                  |
| Capture & recovery                              | Initial capture: < 1 minute; from power outage: 30 seconds; out of service on change of channel after new interference: 100 ms   |
| Transmit power control                          | Adaptive. Varying between 24 dBm and -10 dBm according to modulation selected and radio path   |
| System gain                                     | Varies with modulation mode between 167 dBm and 138 dBm using Integrated antenna*  |
| Receiver sensitivity                            | Adaptive, varying between -96.0 dBm and -72 dBm according to modulation selected   |
| Modulation                                      | Dynamic, adapting between BPSK and 64QAM–(8 Modes)   |
| Error Correction                                | FEC, ARQ   |
| Duplex scheme                                   | TDD/FDD Ratio 50:50, 66:33; Switch Rate 250Hz and Same or Split frequency TX/RX  |
| Antenna: type/gain/B/W                          | Integrated flat plate/23 dBi/7° **   |
| Range   | Up to 124 miles (200 km)***  |
| Data rates                                      | Up to 33.6 Mbps; dynamically variable with modulation range from 3.0 Mbps to 33.6 Mbps (aggregate)   |
| Security & Encryption                           | Proprietary scrambling mechanism; support of VPN; optional AES 128 Bit Encryption  |
|   | * Gain may vary based on regulatory domain<br>** Higher gain antennas available with OS-Gemini (C)<br>*** In all cases the range limit is set by the latest software release |
| Ethernet Bridging                               | Remarks  |
| Protocol  | IEEE 802.3 compatible  |
| User data throughput                            | Dynamically variable: up to 33.6 Mbps at the Ethernet (aggregate)  |
| Packet prioritization                           | IEEE 802.1p  |
| Interface                                       | 10BASE-T/100BASE-T (RJ-45)–auto MDI/MDIX switching   |
| Management & Installation Remarks               |  |
| LED indicators                                  | Power status, Ethernet link status and activity  |
| System management                               | Web Server and SNMP  |
| Installation                                    | Built-in audio assistance for link optimization  |
| Connection                                      | Distance between outdoor unit and primary network connection: up to 330' (100 metres)  |
| Physical  | Remarks  |
| Dimensions                                      | Outdoor unit: Width 14.5" (370 mm), Height 14.5" (370 mm), Depth 3.75" (95 mm)<br>Powered Indoor Unit: Width 6.25" (160 mm), Height 2.5" (63 mm), Depth 1.25" (32 mm)        |
| Weight  | ODU: 12.1 lbs (6.5 kg) including bracket; PIDU: 10 Ounces (286 g)  |
| Wind speed                                      | 150 mph/242 kph  |
| Power supply                                    | Integrated with Indoor Unit  |
| Power source                                    | 90–240 VAC, 50–60 Hz   |
| Power consumption                               | 55W max  |
| Environmental & Regulatory                      | Remarks  |
| Operating temperature                           | -40°F (-40°C) to +140°F (+60°C), including solar radiation   |
| Protection & safety                             | IP65/UL60950; IEC60950; EN60950; CSA-C22.2 No. 60950   |
| Radio   | FCC Part 15, sub-part C 15.247, Eire ComReg 03/42, UK Approval to IR2007   |
| EMC   | USA–FCC Part 15, Class B; Europe–EN 301 489-4  |

### Put OS-Gemini to Work for You

**Network Providers** Where geography is a challenge and infrastructure a priority, mobile operators and Internet providers can offer reliable, robust coverage. Simply use OS-Gemini to backhaul traffic from multiple wireless LAN access points to a point of presence.

**Campus Settings** Are you looking to create a seamless meshed network over a wide geographic area covering multiple buildings and open spaces? OS-Gemini is a cost-effective alternative for municipalities, universities, schools and hospitals.

**Enterprise Applications** A single OS-Gemini link can provide a high-capacity, secure link, quickly creating a seamless local area network between company headquarters and other buildings.

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