

## OS-GEMINI INTEGRATED

# High-Reliability Wireless Ethernet Bridge

For Non-Line-of-Sight, adverse and marginally adverse 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/ 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 dB and 140.5 dB
Receiver sensitivity	Adaptive. Varying between -96.0 dBm and -74.5 dBm according to modulation selected
Modulation	Dynamic, adapting between BPSK and 64QAM–(8 Modes)
Error Correction	FEC, ARQ
Duplex scheme	TDD, Ratio 50:50, 66:33 Switch Rate 250Hz
Antenna: type/gain/B/W	Integrated flat plate/23 dBi/7° *
Range	LoS: Up to 81 miles** (130 km) nLoS: Beyond 25 miles** (40 km) NLoS: Up to 6 miles** (10 km)
Data rates	Dynamically variable with modulation from 3.0 Mbps to 33.6 Mbps (aggregate)
Security & Encryption	Digital, proprietary encryption of the air interface combined with secure tunneling and authentication plus support of VPN. AES 128 Bit Encryption  * Higher gain antennas available with OS-Gemini (C) ** Depending on link path and propagation conditions
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) 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 +131°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 VNS 2107 by May 2004
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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