InfiMAN 2x2

4.9 – 6.4 GHz
Frequency Bands

The **InfiMAN 2x2** is a successful field-proven family of wireless point-to-multipoint products designed for various applications, including fixed wireless access infrastructure for operators and enterprise networks, including nomadic and mobile functionality. It encompasses a number of base station sector units, including those with a beamforming antenna, and a range of subscriber terminals with both various integrated antennas and connectorized ones. The whole family features high spectral efficiency, exceptional reliability and excellent Quality of Service (QoS).

Compared to traditional Point-to-Multipoint systems, both operating range and link reliability have increased significantly through the use of advanced Multiple Antenna Technology and Adaptive Multipoint Access Protocol.

The **InfiMAN 2x2** portfolio represents a unique proposition to all types of operators (e.g. WISP's, organisations of all sizes, government authorities, etc.) wishing to deliver Fast Ethernet data, voice and video services at ultra long ranges, whilst at the same time providing a wide set of networking features and maintaining strict QoS control. With their increased aggregate bit rates and improved coverage range, our base stations now allow operators to cater for more and higher capacity remote subscriber units than ever before, thus reducing capital expenditure on network infrastructure.

Applications

- High-Speed local or wide area corporate networks
- CCTV and Video surveillance Networks
- Triple-play services for Wireless ISP's
- Long-range Rural Connectivity
- Government & Municipal Networks

MIMO 2X2 TECHNOLOGY

MIMO 2x2 stands for Multiple Input / Multiple Output innovative technology and it requires the use of two antennas at both the transmitter and receiver to improve communication performance.

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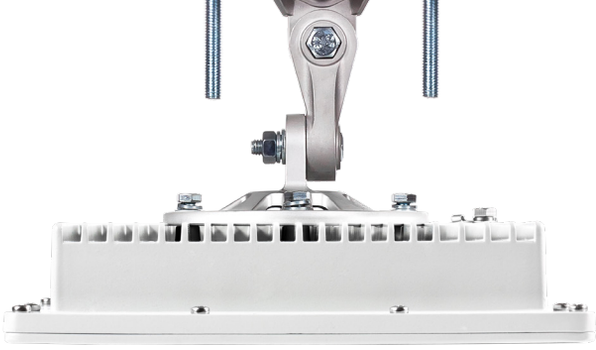
Frequency Bands



Product Highlights

- Available in multiple frequency bands 4.9 – 6.0 and 6.0 – 6.4 GHz
- 240 Mbps base station sector capacity with just 40 MHz of spectrum
- Increased NLOS range and performance
- Supports channel width size from 5 to 40 MHz, reducing licence expenditure
- Advanced Quality-of-Service features, offering a reliable and robust solution
- Base station sectors supported with smart beamforming technology to increase capacity two-fold and improve interference and noise immunity
- Integrated sector antenna Base stations, ensuring maximum RF performance and quick & simple installation
- Unparalleled selection of integrated antenna subscriber terminals ranging from compact and lightweight 19 dBi antenna model to unique 28 dBi terminal ideally suitable for long-range connectivity in excess of 15-25 km from a base station

Features

RADIO

- Voice/RTP Aware Superpacketing
- DFS
- Automatic Bitrate Control
- Automatic Transmit Power Control
- Automatic Distance Learning
- Channel Time Adjustment
- Spectrum Analyzer mode
- Channel testing tools

ENVIRONMENTAL

- **Outdoor Units:** -40..+60°C, 100% humidity, condensing
- **Indoor Unit:** 0..+40°C, 95% humidity, non-condensing

NETWORKING

- Ethernet-over-IP tunneling
- ARP protocol support
- MAC/IP filtering
- Full-fledged 2nd layer switch
- RIPv2 / OSPFv2 /static routing
- Tunneling (Ethernet-over-IP, IP-over-IP)
- L2/L3 Firewall
- NAT (multipool, H.323-aware)
- DHCP client/server/relay

QUALITY-OF-SERVICE

- 17 priority queues
- IEEE 802.1p support
- IP TOS / DiffServ support
- Full voice support
- Traffic limiting (absolute, relative, mixed)
- Traffic redirection

STANDARD COMPLIANCE

- **Radio**
  - EN 301 893 v.1.7.1
  - EN 302 502 v.1.2.1
  - FCC part 15.247
- **EMC**
  - EN 301 489-1
  - EN 301 489-17
  - FCC Part 15 Class B
- **Safety**
  - ETSI EN 60 950-1:2006
- **RoHS**
  - Directive 2002/95/EC

SECURITY FEATURES

- Storm / flood protection
- Password protection
- Secure command-line access via SSH protocol

InfiNet wireless

InfiMAN 2x2 4.9 – 6.4 GHz Frequency Bands Technical Specifications

SYSTEM COMPONENT	InfiMAN 2x2 Base Stations			
Model	**R5000-Qmxb**	**R5000-Mmxb**	**R5000-Omxb**	**R5000-Smnb**
Device description	High-capacity base station sector with an integrated beamforming antenna	High-capacity base station sector with an integrated antenna	High-capacity base station sector for an external antenna	Medium-capacity base station sector with an integrated antenna
Performance	Up to 240 Mbps sector net throughput			Up to 150 Mbps sector net throughput
Distance	Middle-to-long range (20 km)	Middle-to-long range (30+ km)	Middle-to-long range (40+ km)	Middle range (up to 10-15 km)
Frequency Bands / Antennas	• 4.9 – 6.0 GHz / 21 dBi dual-pol integrated beamforming antenna 90°x8° (20° Az-steerable beam)	• 4.9 – 6.0 GHz / 16 dBi dual-pol integrated 90° sector antenna • 6.0 – 6.4 GHz / 16 dBi dual-pol integrated 90° sector antenna	• 4.9 – 6.0 GHz / connectorised antenna (2 x N-type (Female) connectors) • 6.0 – 6.4 GHz / connectorised antenna (2 x N-type (Female) connectors)	• 4.9 – 6.0 GHz / 16 dBi dual-pol integrated 90° sector antenna
Radio	• Radio technology: MIMO 2x2 with OFDM 64/128 • Modulation types: BPSK 1/2 to QAM64 5/6 • Duplex method: TDD • Transmit power: up to 25dBm • Receiver sensitivity: -91 dBm • Channel bandwidth: 10/20/40 MHz	• Radio technology: MIMO 2x2 with OFDM 64/128 • Modulation types: BPSK 1/2 to QAM64 5/6 • Duplex method: TDD • Transmit power: up to 27 dBm (4.9 - 6.0 GHz) up to 23 dBm (6.0 - 6.4 GHz) • Receiver sensitivity: -66 ...-94 dBm • Channel bandwidth: 5/10/20/40 MHz • Instant DFS support (optional)		• Radio technology: MIMO 2x2 with OFDM 64/128 • Modulation types: BPSK 1/2 to QAM64 5/6 • Duplex method: TDD • Transmit power: up to 27 dBm (4.9 - 6.0 GHz) • Receiver sensitivity: -69...-94 dBm • Channel bandwidth: 5/10/20/40 MHz
Antenna	• 21 dBi dual-pol integrated sector beamforming antenna 90°x8° (20° Az-steerable beam)	• 16 dBi dual-pol integrated 90° antenna	• 2 x N-type (Female) connectors	• 16 dBi dual-pol integrated 90° antenna
Wired interfaces	• 1x Gigabit Ethernet port (10/100/1000 Base-T) RJ-45 connector Serial port (RS-232)			• 2 x Fast Ethernet (10/100 Base-T) RJ-45 connector • PoE output at the second Ethernet port
Power consumption	• Consumption: Up to 35 W • Power options: 90-240 VAC @ 50/60 Hz ±43..56 VDC Proprietary PoE	• Consumption: Up to 20 W • Power options: 110-240 VAC @ 50/60 Hz ±43..56 VDC Proprietary PoE		• Consumption: Up to 20 W • Power options: 110-240 VAC @ 50/60 Hz +9..56 VDC Proprietary PoE
Form Factor and Dimensions	**Outdoor Unit (ODU)** **R5000-Qmxb** **21 dBi antenna**  371 x 371 x 90 mm, 4.4 kg	**Outdoor Unit (ODU)** **R5000-Mmxb** **16 dBi antenna**  371 x 371 x 90 mm, 3.4 kg	**Outdoor Unit (ODU)** **R5000-Omxb** **External antenna**  240 x 240 x 57 mm, 2.2 kg	**Outdoor Unit (ODU)** **R5000-Smnb** **16 dBi antenna**  371 x 371 x 83 mm, 2.8 kg
	Indoor Unit **IDU-BS-G(60W)** 151 x 62 x 38 mm, 0.32 kg	**Indoor Unit** **IDU-BS-G** 125 x 72 x 38 mm, 0.3 kg		**Indoor Unit** **IDU-CPE** 85 x 78 x 36 mm, 0.15 kg

InfiMAN 2x2 4.9 – 6.4 GHz Frequency Bands Technical Specifications

SYSTEM COMPONENT	InfiMAN 2x2 Subscriber Terminals		
Model	**R5000-Smn**	**R5000-Lmn**	**R5000-Smnc**
Device description	Integrated antenna subscriber terminal unit	External antenna subscriber terminal unit	Reduced form factor integrated antenna subscriber terminal unit
	All InfiLINK 2x2 LITE models and subscriber terminals can be easily configured to operate in either Point-to-Point or Point-to-Multipoint modes. A simple licence only is required to change their mode of operation from PtMP to PtP or vice-versa		
Performance	• 8 Mbps (up to 8 Mbps net) • 20 Mbps (up to 20 Mbps net) • 50 Mbps (up to 50 Mbps net) • 300 Mbps (up to 180 Mbps net) • License upgradeable		
Distance	• 23 or 24 dBi antenna: middle-to-long range (12-15 km) • 26 dBi antenna: long range (15-20 km) • 27 or 28 dBi antenna: long range (20-25 km)	• Middle-to-long range (25+ km with external high-gain antenna)	• Short-to-middle range (up to 5-7 km)
Frequency Bands / Antenna	• 4.9 – 6.0 GHz / Integrated 23, 26 or 28 dBi Dual-polarization Antenna • 6.0 – 6.4 GHz / Integrated 24 or 27 dBi Dual-polarization Antenna	• 4.9 – 6.0 GHz / Connectorised Antenna (2 x N-type connectors) • 6.0 – 6.4 GHz / Connectorised Antenna (2 x N-type connectors)	• 4.9 – 6.0 GHz / Integrated 19 dBi Dual-polarization Antenna • 6.0 – 6.4 GHz / Integrated 19 dBi Dual-polarization Antenna
Radio	• Radio technology: MIMO 2x2 with OFDM 64/128 • Modulation types: BPSK 1/2 to QAM64 5/6 • Duplex method: TDD • Transmit power: - Up to 25 dBm (4.9-6.0 GHz) - Up to 23 dBm (6.0-6.4 GHz) • Receiver sensitivity: -65..-91 dBm • Channel bandwidth: 5/10/20/40 MHz		
Wired interfaces	• 2 x Fast Ethernet (10/100 Base-T) RJ-45 connector • PoE output at the second Ethernet port		• 1 x Fast Ethernet (10/100 Base-T) RJ-45 connector
Power consumption	• Consumption: Up to 15 W • Power options: 110-240 VAC @ 50/60 Hz +9..56 VDC, Proprietary PoE		
Form Factor and Dimensions	**Outdoor Unit (ODU)** **R5000-Smn 27 or 28 dBi antenna**  600 x 600 x 68 mm, 5.8 kg **R5000-Smn 26 dBi antenna**  371 x 371 x 83 mm, 2.8 kg **R5000-Smn 23 or 24 dBi antenna**  305 x 305 x 61 mm, 1.9 kg	**Outdoor Unit (ODU)** **R5000-Lmn External antenna**  240 x 240 x 50 mm, 1.6 kg	**Outdoor Unit (ODU)** **R5000-Smnc 19 dBi antenna**  209 x 206 x 72 mm, 1.0 kg
	Indoor Unit **IDU-CPE** 85 x 78 x 36 mm, 0.15 kg		

InfiLINK 2x2

4.9 – 6.4 GHz Frequency Bands

The **InfiLINK 2x2** is a wireless Point-to-Point solution, which combines high-speed capability, up to 280 Mbps throughput, with a rich set of best-in-class features and benefits such as leading-edge radio protocols providing unrivalled spectral efficiency and wireless transmissions over distances in excess of 90 km. In its simplest form, it can be deployed by many organisations to provide Ethernet extensions (i.e. LAN-to-LAN) between two locations. In its most advanced configurations, the InfiLINK 2x2 is able to provide a complete infrastructure that enables corporates of all sizes to connect their remote sites to the headquarters, thus allowing the simultaneous transmission of multi-protocol services such as voice, video and data. This family of solutions can also be deployed by mobile operators requiring multi-megabit capacity for their backhaul links.

The **InfiLINK 2x2** range of solutions comprises of a number of high-performance Fixed Broadband Wireless Access (FBWA) units, which operate in both LOS (line-of-sight) and NLOS (non-line-of-sight) environments, in both licensed and unlicensed frequency bands.

MIMO 2X2 TECHNOLOGY

(MIMO—Multiple Input / Multiple Output)

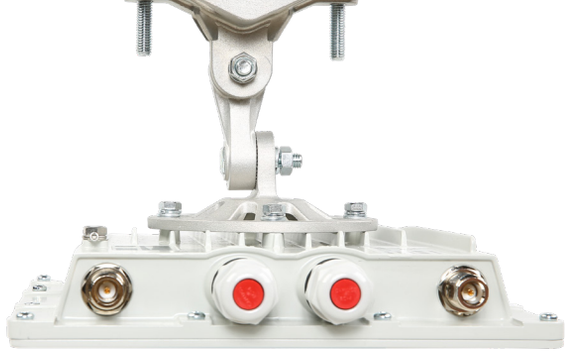
MIMO 2x2 stands for Multiple Input / Multiple Output innovative technology and it requires the use of two antennas at both the transmitter and receiver to improve communication performance.

Applications

- GSM/3G/LTE High-capacity backhaul
- WISP infrastructure backhaul
- Building-to-building connectivity at Fast Ethernet speeds
- Redundant Cellular backhaul
- Cost-effective alternatives to legacy microwave links or wired leased lines
- NLOS backhauling using lower frequency bands
- Reliable backup for fibre lines, high-speed FSO or millimetre- wave links

InfiLINK 2x2

4.9 – 6.4 GHz
Frequency Bands



Product Highlights

- Available in 4.9–6.0 GHz and 6.0–6.4 GHz frequency bands
- Multiple Input - Multiple Output (MIMO 2x2) innovative technology
- “Pay as you grow” software upgradeable capacity feature
- High capacity – up to 280 Mbps net throughput
- 5/10/20/40 MHz channel widths
- Possible operational distances in excess of 90 km
- Unique plug & play out-of-box 5–6 GHz ultra-long backhaul solution
- Gigabit Ethernet port and flexible uplink/downlink reallocation
- LOS (line-of-sight) and NLOS (non-line-of-sight) deployments
- Advanced Quality-of-Service Support

Features

RADIO

- Voice/RTP Aware Superpacketing
- DFS
- Automatic Bitrate Control
- Automatic Transmit Power Control
- Automatic Distance Learning
- Channel Time Adjustment
- Spectrum Analyzer mode
- Channel testing tools

ENVIRONMENTAL

- **Outdoor Units:** -40..+60°C, 100% humidity, condensing
- **Indoor Unit:** 0..+40°C, 95% humidity, non-condensing

NETWORKING

- Ethernet-over-IP tunneling
- ARP protocol support
- MAC/IP filtering
- RIPv2 / OSPFv2 /static routing
- Tunneling (Ethernet-over-IP, IP-over-IP)
- L2/L3 Firewall
- NAT(multipool, H.323-aware)
- DHCP client/server/relay

QUALITY-OF-SERVICE

- 17 priority queues
- IEEE 802.1p support
- IP TOS / DiffServ support
- Full voice support
- Traffic limiting (absolute, relative, mixed)
- Traffic redirection

STANDARD COMPLIANCE

- **Radio**
  - ETSI EN 301 893 v.1.7.1
  - ETSI EN 302 502 v.1.2.1
  - FCC Part 15.247
- **EMC**
  - ETSI EN 301 489-1
  - ETSI EN 301 489-17
  - FCC Part 15 Class B
- **Safety**
  - ETSI EN 60 950-1:2006
- **RoHS**
  - Directive 2002/95/EC

SECURITY FEATURES

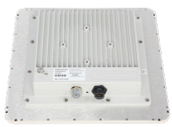
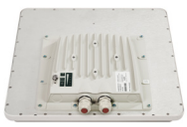
- Storm / flood protection
- Password protection
- Secure command-line access via SSH protocol

InfiNet wireless

InfiLINK 2x2 4.9 – 6.4 GHz Frequency Bands Technical Specifications

RECOMMENDED APPLICATIONS	► High spectral efficiency backhaul for ISP or operator networks ► LAN-to-LAN connectivity at Fast Ethernet or higher speeds ► A cost-effective alternative for legacy microwave links		► Reliable backup for fibre lines, high-speed FSO or millimetre-wave links ► High-capacity capacity backhaul for IP-based CCTV networks ► Long range high capacity network access solution	
PRODUCT FAMILY	InfiLINK 2x2 PRO		InfiLINK 2x2 LITE	
Model	**R5000-Mmx**	**R5000-Omx**	**R5000-Smn**	**R5000-Lmn**
Device description	High capacity Integrated Antenna Point-to-Point Backhaul	High capacity External Antenna Point-to-Point Backhaul	Medium capacity lightweight Integrated 19, 23, 24, 26, 27 or 28 dBi Dual-polarization Antenna Point-to-Point Backhaul	Medium –capacity lightweight External Antenna Point-to-Point Backhaul
			All InfiNet LITE models and subscriber terminals can be easily configured to operate in either Point-to-Point or Point-to-Multipoint modes. A simple licence only is required to change their mode of operation from PtMP to PtP or vice-versa	
Performance	• 300 Mbps (up to 280 Mbps net throughput)		• 8 Mbps (up to 8 Mbps net) • 20 Mbps (up to 20 Mbps net) • 50 Mbps (up to 50 Mbps net) • 300 Mbps (up to 180 Mbps net) • License upgradeable	
Distance	• 23, 24 and 26 dBi antenna Recommended range: up to 10-35 km Maximal range: in excess of 40 km • 27 and 28 dBi antenna Recommended range: up to 20-50 km Maximal range: in excess of 70 km	• Recommended range: up to 90 km (with external high-gain antennas) • Maximal range: in excess of 100 km	• 19 dBi antenna: up to 5-10 km • 23 and 24 dBi antenna: up to 10-25 km • 26 dBi antenna: up to 15-35 km • 27 and 28 dBi antenna: up to 15-50 km	• Long range (up to 70 km with high-gain external antenna)
Frequency Bands/ Antenna	• 4.9 – 6.0 GHz / Integrated 23, 26 or 28 dBi Dual-polarization Antenna • 6.0 – 6.4 GHz / Integrated 24 or 27 dBi Dual-polarization Antenna	• 4.9 – 6.0 GHz / Connectorised (2 x N-type connectors) • 6.0 – 6.4 GHz / Connectorised 2 x N-type connectors)	• 4.9 – 6.0 GHz / Integrated 19, 23, 26 or 28 dBi Dual-polarization Antenna • 6.0 – 6.4 GHz / Integrated 19, 24 or 27 dBi Dual-polarization Antenna	• 4.9 – 6.0 GHz / Connectorised (2 x N-type connectors) • 6.0 – 6.4 GHz / Connectorised 2 x N-type connectors)
Radio	• Radio technology: MIMO 2x2 with OFDM 64/128 • Modulation types: BPSK ½ to QAM64 5/6 • Transmit power: - Up to 27 dBm (4.9-6.0 GHz models) - Up to 23 dBm (6.0-6.4 GHz models) • Receiver sensitivity: -66..-94 dBm • Channel bandwidth: 5/10/20/40 MHz • Instant DFS (optional)		• Radio technology: MIMO 2x2 with OFDM 64/128 • Modulation types: BPSK ½ to QAM64 5/6 • Transmit power: - Up to 25 dBm (4.9-6.0 GHz models) - Up to 23 dBm (6.0-6.4 GHz models) • Receiver sensitivity: -69..-94 dBm • Channel bandwidth: 5/10/20/40 MHz	
Wired interfaces	• Gigabit Ethernet port (10/100/1000 Base-T) RJ-45 connector • Serial port (RS-232)		**Smn 19 dBi** • 1 x Fast Ethernet (10/100 Base-T) RJ-45 connector **Smn 23..28 dBi** • 2x Fast Ethernet (10/100 Base-T) PoE output at the second Ethernet port RJ-45 connector	• 2x Fast Ethernet (10/100 Base-T) PoE output at the second Ethernet port RJ-45 connector
Power consumption	• Consumption: Up to 20 Watts • Power options: 110-240 VAC @ 50/60 Hz ±43..56 VDC Proprietary PoE		• Consumption: Up to 15 Watts • Power options: 110-240 VAC @ 50/60 Hz +9..56 VDC Proprietary PoE	

InfiLINK 2x2 4.9 – 6.4 GHz Frequency Bands Technical Specifications

PRODUCT FAMILY	InfiLINK 2x2 PRO		InfiLINK 2x2 LITE	
Model	**R5000-Mmx**	**R5000-Omx**	**R5000-Smn**	**R5000-Lmn**
Form factor and dimensions	**Outdoor Unit (ODU)** **R5000-Mmx** **27 or 28 dBi antenna**  600 x 600 x 75 mm, 6.4 kg **R5000-Mmx** **26 dBi antenna**  371 x 371 x 90 mm, 3.4 kg **R5000-Mmx** **23 or 24 dBi antenna**  305 x 305 x 68 mm, 2.5 kg	**Outdoor Unit (ODU)** **R5000-Omx** **External antenna**  240 x 240 x 57 mm, 2.2 kg	**Outdoor Unit (ODU)** **R5000-Smn** **27 or 28 dBi antenna**  600 x 600 x 68 mm, 5.8 kg **R5000-Smn** **26 dBi antenna**  371 x 371 x 83 mm, 2.8 kg **R5000-Smn** **23 or 24 dBi antenna**  305 x 305 x 61 mm, 1.9 kg **R5000-Smn** **19 dBi antenna**  209 x 206 x 72 mm, 1.0 kg	**Outdoor Unit (ODU)** **R5000-Lmn** **External antenna**  240 x 240 x 50 mm, 1.6 kg
	Indoor Unit (IDU-BS-G) 125 x 72 x 38 mm 0.3 kg		**Indoor Unit (IDU-CPE)** 85 x 78 x 36 mm 0.15 kg	