

## Solution Benefits

- Low entry cost and remote capacity upgrades
- Better ROI achieved through the use of wider channel sizing and unprecedented radio performance
- Seamless integration into existing infrastructures
- Huge savings on third-party networking equipment
- Extra ROI achieved through the provision of service levels agreements
- Low running costs for servicing and maintenance
- Flexible frequency planning and high spectral efficiency
- Ultra-low latency and jitter, optimal for video and voice transmissions

## 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.



## The InfiLINK 2x2 Family

### Introduction

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.

Featuring highest performing hardware and operating system coupled with most innovative radio technology providing with best sensitivity, increased output power across all modulations and wide dynamic range, InfiLINK 2x2 represents a perfectly balanced solution for any type of Point-to-Point connectivity.

The InfiLINK 2x2 is a wireless Point-to-Point solution which combines high-speed capability, up to 300 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 80 km.

InfiNet Wireless' diverse range of solutions enables Service Providers of all types to build higher capacity networks with even fewer network elements, thereby significantly reducing their overall Capex and subsequent Opex throughout the life of their network.

The InfiLINK 2x2 product family is an optimal solution for a large number of applications. 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.

In all these applications, our solutions offer operational cost saving benefits such as quick deployment, ease of configuration and the ability to upgrade existing infrastructures via software download to cater for new requirements (i.e. "pay as you grow").

### Applications

Key applications of the InfiLINK 2x2 Family include:

- 4G/LTE/WiMAX BTS High-capacity backhaul
- WISP infrastructure backhaul
- Building-to-building connectivity at Fast Ethernet speeds
- Redundant Cellular backhaul, multiple E1/T1 TDM & Ethernet/IP transport
- A cost-effective alternative for legacy microwave links or wired leased lines
- WISP Internet POP for remote areas
- NLOS backhauling using lower frequency bands
- Reliable backup for fiber lines, high-speed FSO or millimeter-wave links

### Product Key Features and Highlights

- Available in 2.3 – 2.6 GHz, 4.9 – 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 300 Mbps throughput
- 5/10/20/40 MHz channel widths
- Possible operational distances in excess of 80 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
- Reliable and robust design

# Equipment

## Recommended applications

- High-capacity CCTV infrastructure backhaul
- 4G/LTE/WiMAX BTS High-capacity backhaul
- WISP infrastructure backhaul
- WISP Internet POP for remote areas
- Redundant Cellular backhaul, multiple E1/T1 TDM & Ethernet/IP transport
- Reliable easy-to-install backhaul at Fast Ethernet speeds

- Reliable backup for fiber lines, high-speed FSO or millimeter-wave links
- 35/50 Mbps CCTV backhaul
- A cost-effective alternative for legacy microwave links
- Ultra-high spectral efficiency 35/50 Mbps net throughput backhaul

## System components

### Model

### Device description

### Performance

### Distance

### Radio

### Wired interfaces

### Power consumption

### Form factor and dimensions

## InfiLINK 2x2 PRO

### R5000-Mmx

High-capacity 40/80/150/300 Integrated 23 or 28 dBi Dual-polarization Antenna Point-to-Point Backhaul

- 40, 80, 150 and 300 Mbps throughput options (license upgradeable)

- Middle-to-long range (30+ km)

- Radio technology: MIMO 2x2 with OFDM 64/128
- Modulation types: BPSK 1/2 to QAM64 5/6
- Transmit power: up to 18 or 23 dBm (model-dependent)
- Receiver sensitivity: -67..-101 dBm
- Frequency bands: 4.9-6.0 GHz
- Channel bandwidth: 5/10/20/40 MHz
- 23 or 28 dBi dual-pol integrated antenna

- Gigabit Ethernet port (10/100/1000 Base-T) RJ-45 connector
- Serial port (RS-232)

- Up to 12 Watts
- Consumption: 110-240 VAC @ 50/60 Hz 48 VDC

- Outdoor Unit (ODU): 23 dBi antenna model 370 x 370 x 85 mm 3.7 kg 28 dBi antenna model 600 x 600 x 70 mm 6.8 kg
- Indoor Unit (IDU-BS-G) 124 x 72 x 38 mm 0.3 kg

### R5000-Omx

High-capacity 40/80/150/300 External Antenna Point-to-Point Backhaul

- 40, 80, 150 and 300 Mbps throughput options (license upgradeable)

- Ultra-long range (80+ km)

- Radio technology: MIMO 2x2 with OFDM 64/128
- Modulation types: BPSK 1/2 to QAM64 5/6
- Transmit power: up to 18 or 23 dBm (model-dependent)
- Receiver sensitivity: -67..-101 dBm
- Frequency bands: 2.3-2.6, 4.9-6.4 GHz
- Channel bandwidth: 5/10/20/40 MHz
- 2 x N-type (Female) connectors

- Gigabit Ethernet port (10/100/1000 Base-T) RJ-45 connector
- Serial port (RS-232)

- Up to 12 Watts
- Consumption: 110-240 VAC @ 50/60 Hz 48 VDC

- Outdoor Unit (ODU): 240 x 240 x 51 2.3 kg
- Indoor Unit (IDU-BS-G): 124 x 72 x 38 mm 0.3 kg

## InfiLINK 2x2 LITE

### R5000-5m

12/20/35/50 Mbps High-capacity Integrated 21 or 23 dBi Dual-Polarization Antenna Backhaul

- 12/20/35/50 Mbps throughput options (license upgradeable)

- Middle range (20+ km)

- Radio technology: MIMO 2x2 with OFDM 64/128
- Modulation types: BPSK 1/2 to QAM64 5/6
- Transmit power: up to 18 dBm
- Receiver sensitivity: -67..-101 dBm
- Frequency bands: 4.9-6.0 GHz
- Channel bandwidth: 5/10/20/40 MHz
- 21 or 23 dBi dual-pol integrated antenna

- 1 x Fast Ethernet (10/100 Base-T) RJ-45 connector
- 1x Fast Ethernet PoE (802.3af) output port (optionally) RJ-45 connector
- Serial port (RS-232)

- Up to 7 Watts
- Consumption: 110-240 VAC @ 50/60 Hz 12-48 VDC

- Outdoor Unit (ODU): 370 x 370 x 85 mm 3 kg
- Indoor Unit (IDU-CPE): 85 x 76 x 36 mm 0.15 kg

### R5000-Lm

12/20/35/50 Mbps High-capacity External Antenna Backhaul

- 12/20/35/50 Mbps throughput options (license upgradeable)

- Long range (60+ km)

- Radio technology: MIMO 2x2 with OFDM 64/128
- Modulation types: BPSK 1/2 to QAM64 5/6
- Transmit power: up to 18 dBm
- Receiver sensitivity: -67..-101 dBm
- Frequency bands: 2.3-2.6, 4.9-6.4 GHz
- Channel bandwidth: 5/10/20/40 MHz
- 2 x N-type (Female) connectors

- 1 x Fast Ethernet (10/100 Base-T) RJ-45 connector
- Serial port (RS-232)

- Up to 7 Watts
- Consumption: 110-240 VAC @ 50/60 Hz 12-48 VDC

- Outdoor Unit (ODU): 240 x 240 x 51 mm 1.6 kg
- Indoor Unit (IDU-CPE): 85 x 76 x 36 mm 0.15 kg

## Features

### RADIO

- **Voice/RTP Aware Superpacketting**
  - to minimize jitter and latency for multimedia applications
- **DFS**
  - for Radar Detection and intelligent search for cleanest channel within a regulatory domain
- **Automatic Bitrate Control**
  - to ensure a 100% stable link irrelevant of changes in external conditions
- **Automatic Transmit Power Control**
  - to track and keep optimal input signal level to maximize performance for each link and reduce overall interference within a given transmit power and EIRP limitations
- **Automatic Distance Learning**
  - to optimize performance for any link distances from tens of meters to 100 km and above
- **Channel Time Adjustment**
  - to improve performance on heavily loaded links
- **Spectrum Analyzer mode**
  - for interference detection and avoidance
- **Channel testing tools**
  - channel performance measurement
  - advanced diagnostics

### MAC

- **Dynamic adaptive Polling**
  - Centralized marker grant mode
  - Dynamically takes into account channel activity
  - Permanent channel testing
- **Pseudo-radio Interface**
  - unique InfiNet Wireless feature to join InfiNet Wireless networks via 3rd party equipment (Wired Ethernet segments, IP clouds)
- **Automatic over-the-air firmware upgrade**

### MANAGEMENT FEATURES

- **Web-interface**
  - basic settings
  - channel diagnostics: spectrum analysis, antenna alignment, channel throughput measurement
  - unit and RF links monitoring
  - maintenance: firmware upgrade, license and configuration import/export
  - tech support diagnostic reports generation
  - command-line access
- **Command-line interface for in-depth configuration and diagnostics accessible via:**
  - secure shell (SSH)
  - telnet
  - serial port
  - remote shell
- **SNMPv1 / SNMPv3 support** (MIB II, private MIB)
- **Configurable SNMP Traps**

### STANDARD COMPLIANCE

- **Radio**
  - ETSI EN 301 893 v.1.5.1
  - ETSI EN 302 502 v.1.2.1
  - FCC Part 15.247
  - FCC Part 90
- **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

### NETWORKING

- **Ethernet-over-IP tunneling**
- **ARP protocol support**
- **MAC/IP filtering**
- **Fully-fledged Layer 2 switch:**
  - Transparent transport for any type of Ethernet traffic including MPLS, stacked VLANs, etc.
  - Multiple switching groups
  - Full VLAN support including Q-in-Q (IEEE 802.1q and 802.1ad)
  - STP/rSTP support
  - IGMP Snooping with Querrier mode
  - Trunk groups support
- **RIPv2 / OSPFv2 /static routing**
- **Tunneling** (Ethernet-over-IP, IP-over-IP)
- **L2/L3 Firewall**
- **NAT**(multipool, H.323-aware)
- **DHCP client/server/relay**

### SECURITY FEATURES

- **Line-speed AES128 over-the-air encryption**
- **Storm / flood protection**
- **Password protection**
- **Protocol messages encryption**
- **Secure command-line access via SSH protocol**

### QUALITY-OF-SERVICE

- With many QoS permutations, QoS implementation works transparently in the network based on IEEE802.1p standard as well as ToS/DiffServ, guaranteeing perfect performance under any load and lowest jitter/delays for priority traffic.
- Quality-of-Service features:**
- **16 priority queues**
  - **IEEE 802.1p support**
  - **IP TOS / DiffServ support**
  - **Full voice support**
  - **Traffic limiting** (absolute, relative, mixed)
  - **Traffic redirection**

### ENVIRONMENTAL

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