



Delivering Tomorrow's High-Capacity Wireless Infrastructure Solutions Today

Carrier-Grade Wireless Infrastructure Solutions for BWA Networks supporting
Mission-Critical Business Applications for Wireless Service Providers, CCTV
Video Surveillance Networks, Public Safety Authorities & Municipalities

SUMMARY FACT SHEET

InfiNet Wireless Fact Sheet

Headquarters: Moscow, Russia

Founded:

- In 1993, initially as a business unit of Comptek International, then as an independent and autonomous entity in 2003

Mission:

- Delivering industry-leading performance and unparalleled reliability for high-capacity wireless networking infrastructures

Targeted End Users:

- GSM/3G/LTE operators
- WiMax operators
- Internet Service Providers
- Enterprises of all sizes Requirements
- Energy operators
- Public safety and Homeland authorities
- Governments
- Armies
- Municipalities
- Etc.

Solutions Portfolio:

- InfiLINK™, InfiLINK 2x2™ and InfiLINK 2x2 3.5 GHz™ solutions for high-capacity Point-to-Point link requirements
- InfiMAN™, InfiMAN 2x2™ and InfiMAN 2x2 3.5 GHz™ solutions for Point-to-Multipoint deployments in wireless rural or urban networks
- Solutions operate in a number of frequency bands including 2.3-2.6 GHz, 3.4-3.7 GHz and 4.9-6.4 GHz
- Scalable MIMO design based on OFDM and native IP technologies for LOS and NLOS support

Applications:

- Backhauling voice and data traffic for GSM/3G/LTE and WiMax operators
- Connectivity in the backbone and access layers for Internet Service Providers
- Video surveillance for public safety authorities and municipalities
- High-Speed local or wide area corporate networks for the simultaneous transmission of multi-services such as voice, video and data
- Provision of Reliable backup for fibre lines, high-speed FSO or millimetre-wave
- Etc.

MAJOR MILESTONES

- 1993
Started technology development as a business unit of CompTek Intl.
- 1994
First products shipped
- 1996
Launched SkyMAN, forming the infrastructure for the first FBWA network in Russia/CIS
- 1998
Launched full 2.4GHz product line
- 2003
Spun out as independent company, InfiNet Wireless
- 2003
Launched 5GHz full outdoor FBWA product line
- 2005
Enters global market
- 2005
Private investment funding from Intel Capital, ING Baring Vostok and Russia Now
- 2006
Releases MINT wireless architecture, unique wireless protocols for unified wireless platform management
- 2007
Launched the Dual & Quad Radios with WiFi for nomadic & mobility applications
- 2008
Launched PTP MIMO with 300Mbps capacity
- 2008
Launched PTMP MIMO with 300Mbps base stations
- 2008
Launched E1 support systems
- 2009
Created the RapidView for easy installation
- 2010
Launched the MIMO systems for 3.5GHz platform

A Rich Heritage of Leading Edge Wireless Solutions

Established in 1993, InfiNet Wireless was created to initially provide Internet Service Providers and Telecommunication Carriers with leading edge wireless solutions for first and last mile Broadband Access. Today, InfiNet Wireless' products have been deployed in thousands of networks in more than 50 countries. Our solutions set the benchmark for carrier-grade multi-service Broadband Wireless Access systems.

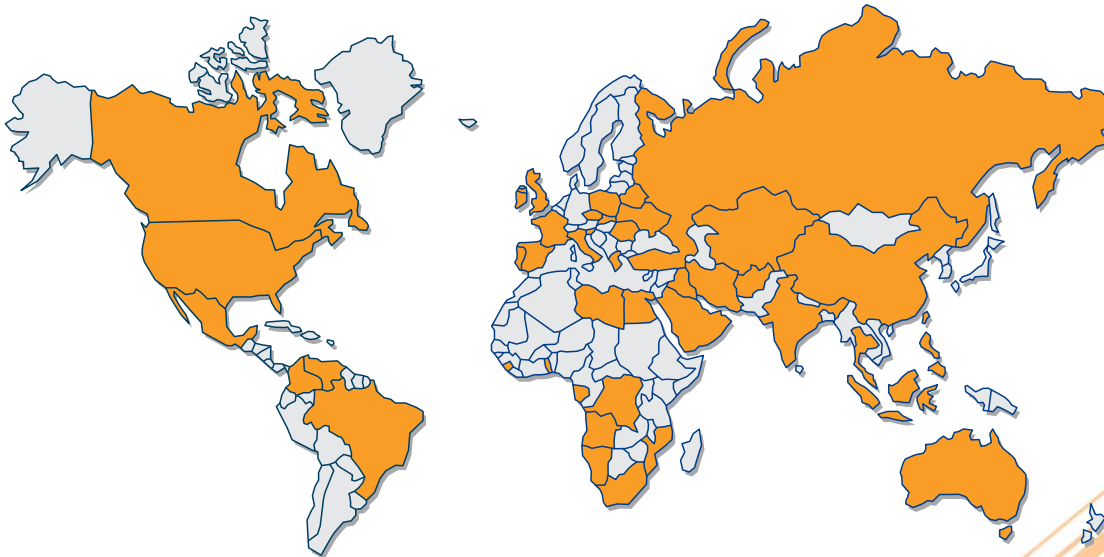
Next Generation Wireless Networks from InfiNet Wireless

InfiNet Wireless has earned a reputation as a global manufacturer of innovative, flexible, high performance and reliable fixed wireless broadband solutions (FBWA).

Continuing with our pioneering breakthroughs, our extensive family of products was designed and optimized for a number of applications ranging from backhauling traffic for mobile and WiMAX operators, to providing point-to-point (PTP) as well as point-to-multipoint (PtMP) connectivity for internet service providers, government and military organizations, municipalities and enterprise customers.

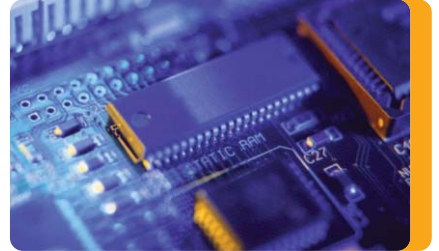
Our team at InfiNet Wireless excels at meeting and exceeding the ever-changing connectivity needs of all types of service providers as they design and deploy their own voice, data and video wireless infrastructures.

InfiNet Wireless' leading-edge solutions represent more than 17 years of R&D efforts by world-class engineers and developers, who possess extensive experience in the design and field deployment of thousands of wireless networks all over the world. Our technology, while remaining fully market-driven, was one of the first ones to combine scalability with high performance, and today ranks among the most reliable in the wireless industry.



Mission Statement

The InfiNet Wireless mission is to deliver industry-leading performance, unparalleled reliability and lowest cost of ownership solutions for high-capacity wireless networking infrastructure, enabling our customers to build thriving and profitable businesses.



The InfiNet Difference

Dependability and Delivery

InfiNet's innovative product developments are driven 100% by the needs of our customers. We simply perfect the possibilities and deliver.

In a wireless industry that seems to be focusing on conformity to a standard with perpetually shifting goal posts, hype, uncertainty, deployment delay and broad promises that simply can't be delivered today, or be guaranteed tomorrow, our clients are deploying and using the very latest innovative products with the confidence that they will also seamlessly integrate with tomorrow's solutions.

We deliver today what others promise for tomorrow.

Our Technology Differentiators

INNOVATION: Our greatest assets are the people we employ and the innovative company culture we have created around them. Our skilled professionals have many years experience in the IT, Electronics, RF engineering, military and space industries. They are constantly scanning the hi-tech markets, evaluating new technologies and adopting the latest cutting-edge techniques and components when designing and developing our products.

RELIABILITY: All our solutions were designed and built to operate in the harshest possible environments and have been deployed from the plains of Siberia to the depths of the Sahara. InfiNet prides itself on designing the most robust and reliable systems available today in the marketplace.

PERFORMANCE: Experience, extensive market research and advanced engineering techniques have made InfiNet the brand of choice among partners and end users looking for high-performance wireless solutions that can cover long distances and provide sufficient bandwidth for their connectivity needs, without sacrificing the overall Quality of Service (QoS).

SCALABILITY & FLEXIBILITY: Our "pay-as-you-grow" philosophy, starting right from the R&D stage, has resulted in products which are topology-agnostic, able to support multiple-frequency bands and based on a universal wireless platform which can be tailored to individual customer requirements, whilst at the same time protecting their initial investment and providing a clear migration path to meet their future needs as their business grows over time.

QUALITY: An important part of our corporate mission is to identify customer needs, develop innovative products, continually improve our operations and commit to produce the highest quality, competitive products from simple PTP connectivity to complex mission-critical communication networks. This is backed by our extended warranties which are among the most comprehensive ones in the wireless industry.

INTEGRATION: All our solutions are sophisticated in design, yet easy to install. They are based on industry-standard protocols and networking feature sets, and as such work seamlessly with many third party products and solutions. This approach provides our customers and partners all over the world with the potential for faster integration into existing infrastructures and a much greater ease of operational management.

InfiNet Wireless is able to provide tailored solutions for all types of applications. Our range of products offer unique and powerful routing and switching capabilities, enabling optimised network design, along with high reliability, scalability and unsurpassed robustness, whether you are deploying a standalone PTP connection or a comprehensive wireless architecture

Our high-performance solutions operate in both LOS (line-of-sight) and NLOS (non-line-of-sight) environments, across both licensed and unlicensed frequency bands, from 2.4 GHz all the way to 6.4 GHz.



Network topology	Point-to-Point		
	InfiLINK 2x2	InfiLINK 2x2 3.5 GHz	InfiLINK
Product family	InfiLINK 2x2	InfiLINK 2x2 3.5 GHz	InfiLINK
Performance	High-capacity (up to 300 Mbps)	High-capacity (up to 300 Mbps)	Medium-Capacity (up to 36 Mbps)
Operating distances	up to 80 km	up to 80 km	up to 60 km
Frequency bands	2.3 – 2.6 GHz 4.9 – 6.4 GHz	3.4 – 3.7 GHz	2.3 – 2.6 GHz 4.9 – 6.4 GHz

Network topology	Point-to-Multipoint		
	InfiMAN 2x2	InfiMAN 2x2 3.5 GHz	InfiMAN
Product family	InfiMAN 2x2	InfiMAN 2x2 3.5 GHz	InfiMAN
Performance	High-capacity (up to 240 Mbps)	High-capacity (up to 240 Mbps)	Medium-Capacity (up to 34 Mbps)
Sector coverage	up to 25 km	up to 25 km	up to 25 km
Frequency bands	2.3 – 2.6 GHz 4.9 – 6.4 GHz	3.4 – 3.7 GHz	2.3 – 2.6 GHz 4.9 – 6.4 GHz

We offer complete solutions that allow service providers to increase efficiency and productivity while not only fitting any budget constraints they may have but also maintaining the expected high standards for performance and quality of service (QoS).

InfiLINK 2x2
InfiLINK 2x2 3.5 GHz
InfiLINK

Point-to-Point
Backhaul
Up to 4E1/T1

InfiMAN 2x2
InfiMAN 2x2 3.5 GHz
InfiMAN

Point-to-MultiPoint
Long Range

The InfiLINK 2x2 Family High-capacity Point-to-Point

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.

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.

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.

Applications

- 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
- Operational distances in excess of 80 km
- Integrated 28 dBi antenna model – one-box solution for 50+ km PTP links
- LOS (line-of-sight) and NLOS (non-line-of-sight)
- Gigabit Ethernet port
- Advanced Quality-of-Service Support
- Reliable and robust design

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

InfiLINK 2x2 Family Equipment

InfiLINK 2x2 PRO

R5000-Mmx

Integrated 23 or 28 dBi antenna Point-to-Point (40/80/150/300 Mbps)

R5000-Omx

External antenna Point-to-Point (40/80/150/300 Mbps)

InfiLINK 2x2 LITE

R5000-Sm

Integrated 23 dBi antenna Point-to-Point (35/50 Mbps)

R5000-Lm

External antenna Point-to-Point (35/50 Mbps)

TDM Transport

2xE1/T1 Indoor Unit

4xE1/T1 Indoor Unit

InfiLINK 2x2 3.5 Ghz

High-capacity 3.5 GHz Point-to-Point

Introduction



The InfiNet Wireless 2x2 family of products was among the very first radio solutions to introduce MIMO technology for Broadband Wireless Access, and has continued ever since to set new standards across the industry for throughput, spectrum optimisation, efficiency, Quality of Service and system reliability.

The InfiLINK 2x2 3.5 GHz is a high-performance broadband wireless point-to-point solution designed to operate in the licensed 3.4 to 3.7 GHz frequency range. The various products within this family have been designed primarily to cater for the specific requirements of local authorities, service providers or other organizations that have purchased WiMAX licences. They enable them to deploy more efficient and scalable networks for data, video and voice, whilst at the same time offering up to five times the throughput of existing systems in this frequency range. This is achieved with even fewer network elements, thereby reducing the overall Whole-Life Cost of managing their networks..

The inherent features built into our 3.5 GHz solutions are key enablers in licence-exempt backhauls for CCTV/IP surveillance systems, Wireless-ISP networks, high-capacity corporate connectivity and last-mile provisioning, as well as for backing up Free Space Optics (FSO) and microwave links.

Applications

- 4G/LTE/WiMAX BTS High-capacity backhaul
- WISP infrastructure backhaul and internet PoP for remote locations
- Building-to-building or LAN-to-LAN connectivity at Gigabit Ethernet speeds
- Redundant Cellular backhaul, multiple E1/T1 TDM & Ethernet/IP transport
- Cost-effective alternatives to legacy microwave links
- NLOS and nLOS configurations
- Reliable backup for fibre lines, high-speed FSO or millimetre-wave links

Product Key Features and Highlights

- Available in 3.4 to 3.7 GHz frequency bands
- High spectral efficiency 6.5 Bit/s/Hz
- Multiple Input - Multiple Output (MIMO 2x2) innovative technology
- "Pay as you grow" software upgradeable features
- High-capacity - up to 240 Mbps effective throughput
- Channel width: 3.5/5/7/10/14/15/20/28/30/40 MHz
- Operational distances in excess of 80 km
- Gigabit Ethernet port
- LOS (Line-Of-Sight) and NLOS (Non-Line-of-Sight)
- Advanced Quality-of-Service Support
- Robust design

Solution Benefits

- Maximise your investment in the licensed 3.5GHz spectrum by offering improved throughput, spectral efficiency and a wider range of services and applications
- Transmission in LOS, nLOS and NLOS configurations
- Class-leading equipment span & reach
- Proven field reliability & robustness, based on InfiNet's well-known InfiLINK 2x2 product family
- Low Cost entry and "pay as you grow" model to easily up-scale capacity
- Simple integration into existing infrastructure
- Significantly reduced total cost of ownership (TCO)
- Ultra-low latency and jitter for optimal transmission of video and voice data

InfiLINK 2x2 3.5 Family Equipment

R5000-Mmx

Integrated 22 dBi antenna Point-to-Point (40/80/150/300 Mbps)

R5000-Omx

External antenna Point-to-Point (40/80/150/300 Mbps)

Wireless TDM transport

Introduction

InfiNet Wireless TDM Transport Equipment is used for transmitting up to 4 E1/T1 streams over InfiNet Wireless Point-to-Point backhaul links based on InfiLINK 2x2 product. Implemented as an indoor 19" 1U unit TDM Transport equipment from InfiNet Wireless it is an optimal solution for low-latency, low-jitter connectivity for streaming both E1/T1 streams and Ethernet data.

General Features

- E1/T1 TDM Transport Indoor Units can be used with InfiLINK 2x2 and InfiLINK 2x2 3.5 GHz equipment
- Multihop Automatic Mode allows avoiding E1/T1 indoor units usage in repeater sites

Ethernet Interface

- **Wired network connection:**
Ethernet 10/100BaseT (RJ-45)
- **Wired network interface:**
IEEE 802.3 CSMA / CD and Ethernet Blue Book

E1/T1 Interfaces

- **2xE1/T1 and 4xE1/T1 options are available**
- **Framing:**
Unframed (transparent)
Standard Compliance ITU-T G.703, G.704, G.823
- **Line Code E1:**
HDB3 @2.048 Mbps
- **Line Code T1:**
B8ZS @1.544 Mbps
- **Latency:**
8 ms (typical)
- **Connector:**
RJ-45
- **Jitter / Wander Compliance:**
G.823, G.824
- **Accurate TDM clock recovery**
- **Loopback, internal, external and adaptive timing**
- **Out-of-band CAS transmission**
- **TDM is strictly prioritized over data**

Wireless TDM Transport Equipment

IDU-RJ-2E1

Indoor TDM unit, 19", 1 U, 2 E1/T1 ports

IDU-RJ-4E1

Indoor TDM unit, 19", 1 U, 4E1/T1 ports



The InfiMAN 2x2 Family

High-capacity Point-to-Multipoint

Introduction



The InfiMAN 2x2 is the latest product family to be added by InfiNet Wireless to its already well proven Point-to-Multipoint portfolio, offering unprecedented increase in base station capacity and coverage.

The innovative high-speed base stations and CPE models are available for both licensed and unlicensed bands. As an example, the base station units provide a high sector capacity of up to 240 Mbps and uses leading-edge radio protocols providing unrivalled spectral efficiency.

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 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.

InfiNet Wireless' InfiMAN 2x2 product family is an optimal solution for a diverse range of applications, from Wireless ISP's requiring multi-megabit capacity, to corporates, from government authorities to mobile operators.

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

Key Features and Highlights

- Available in multiple frequency bands, ranging from 2.3 to 2.6 GHz, and from 4.9 to 6.4 GHz
- 100 Mbps base station sector capacity with just 20 MHz of spectrum, reducing capital expenditure
- Up to 240 Mbps Net throughput per sector in 40 Mhz
- 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
- High Transmit Power Base Stations
- High-gain integrated sector antenna base station and subscriber terminal models, ensuring maximum performance and quick and simple installation
- Spectral Efficiency up to 5.3 bit/s/Hz

Solution Benefits

- Faster ROI using more capacity in less spectrum
- Best-in-Class Price/Functionality Ratio
- Savings on third-party networking equipment
- Pure IP transport, allowing simultaneous transmission of data, video and voice services
- High MTBF, less resources needed for servicing and maintenance
- Flexible frequency planning and high spectral efficiency, reducing licensing costs
- Ultra-low latency and jitter, optimal for video and voice data transmitting
- Rapid deployment

InfiMAN 2x2 Family Equipment

R5000-Mmx

Base station unit with integrated 90 deg sector antenna, output power up to 23 dBm (model-dependent), aggregated net throughput up to 240 Mbps (model-dependent)

R5000-Omx

Base station unit, connectorized (two N-type female connectors), output power up to 23 dBm (model dependent), aggregated net throughput up to 240 Mbps (model-dependent)

R5000-Smc

21 dBi integrated dual-polarity flat panel antenna MIMO Subscriber Terminal. "Pay as you grow" capacity from 4 to 35 Mbps net throughput

R5000-Lmc

External antenna MIMO Subscriber Terminal. "Pay as you grow" capacity from 4 to 35 Mbps net throughput

The InfiMAN 2x2 3.5 Ghz High-capacity 3.5 GHz Point-to-Multipoint

Introduction



The InfiMAN 2x2 3.5 is InfiNet's latest family of solutions designed to operate in the licensed band 3.4 to 3.7 GHz. It comprises of a number of high-performance broadband wireless point-to-multipoint modules, designed primarily to cater for the specific requirements of local authorities, service providers or other organizations that have purchased WiMAX licences.

The innovative high-speed base stations provide an unparalleled sector capacity and use leading-edge radio protocols to provide unrivalled spectral efficiency. They enable operators to deploy more efficient and scalable networks for data, video and voice transmission, whilst at the same time offering up to five times the throughput of existing systems in this frequency range.

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 3.5 series represents a unique proposition to operators who have already invested in a WiMAX license but now wish to deliver data, voice and video services over long distances, whilst at the same time providing a wide set of networking features and maintaining strict QoS control.

Applications

- Triple-play services for Wireless ISP's
- Long-range Rural Connectivity
- CCTV and Video surveillance Networks
- Military Networks
- Government & Municipal Networks

Key Features and Highlights

- Available in 3.4 to 3.7 GHz frequency bands
- Unrivalled spectral efficiency of 6.5 Bit/s/Hz
- Increased NLOS range and performance
- 3.5/5/7/10/14/15/20/28/30/40 MHz channel widths
- Advanced Quality-of-Service features, offering a reliable and robust solution
- Highest gain integrated antenna subscriber units, ensuring maximum RF performance and quick & simple installation

Solution Benefits

- Faster ROI using more capacity in less spectrum
- Best-in-Class Price/Functionality Ratio
- Savings on third-party networking equipment
- Pure IP transport, allowing simultaneous transmission of data, video and voice services
- High MTBF, less resources needed for servicing and maintenance
- Flexible frequency planning and high spectral efficiency, reducing licensing costs
- Ultra-low latency and jitter, optimal for video and voice data transmitting
- Easy and fast deployment

InfiMAN 2x2 3.5 Family Equipment

R5000-Omxb

Base station unit, connectorized (two N-type female connectors), transmit power up to 23 dBm, aggregated net throughput up to 240 Mbps

R5000-Smc

Subscriber Terminal, 22 dBi integrated MIMO antenna. "Pay as you grow" capacity from 1 to 35 Mbps net throughput

R5000-Lmc

Subscriber Terminal, external MIMO antenna. "Pay as you grow" capacity from 1 to 35 Mbps net throughput

Cost Effective Terminals

For PTP & PTMP topologies



These cost effective terminals are designed to be lower in cost but still rich with all the features of its' cousins in the respective product families. The only limitation is the bandwidth.

These cost effective terminals still retains the same kind of flexibility and performance reliability. Please refer to the individual datasheets to understand its features.

Applications

Key applications:

- High-Speed, City-Wide Corporate Networks
- CCTV and Video surveillance Networks
- Multipoint WISP infrastructure

Key Features and Highlights

- Available in multiple frequency bands, including 2.3 - 2.6 Ghz, 3.4-3.7 Ghz, 4.9-6.4 GHz
- Remotely-upgradeable capacity
- Supports channel width size from 5 to 40MHz
- Advanced Quality-of-Service Features

Lower Cost of Investment
Same Features as its cousins
Same Flexibility and Reliability

Cost Effective Terminals

R5000-Smc

21 dBi integrated dual-polarity flat panel antenna MIMO Subscriber Terminal. "Pay as you grow" capacity from 4 Mbps to 35 Mbps net throughput

R5000-Lmc

External antenna MIMO Subscriber Terminal. "Pay as you grow" capacity from 4 Mbps to 35 Mbps net throughput

R5000-Sc

22 dBi integrated flat panel antenna Subscriber Terminal. "Pay as you grow" capacity from 12 Mbps to 36 Mbps net throughput

R5000-Lc

External antenna Subscriber Terminal. "Pay as you grow" capacity from 12 Mbps to 36 Mbps net throughput

InfiLINK

Medium-capacity Point-to-Point

Introduction



The InfiLINK product family consists of a range of wireless solutions designed to provide cost-effective, robust and reliable connectivity in networks of all types. With net throughput of up to 36 Mbps and a set of best-in-class networking features such as operational distances in excess of 60 km, the InfiLINK is available in both licensed and unlicensed frequency bands.

The InfiLINK is a wireless Point-to-Point solution which supports a wide range of networking features and frequency bands, enabling service providers to build reliable infrastructures with wireless

products offering the best available price/performance ratio.

The InfiLINK product family is an ideal solution for many organizations wishing to deploy LAN-to-LAN connectivity or bring remote sites closer to their headquarters by allowing them to share simultaneously multi-protocol services such as voice, video and data. Other applications include:

Applications

- Cellular backhaul
- WISP Internet POP for remote areas
- WISP infrastructure backhaul
- Long-range backhaul reaching distances up to 60 km
- Reliable backup for fiber lines, high-speed FSO or millimeter-wave links
- A cost-effective alternative for legacy microwave links or leased lines

Product Key Features and Highlights

- Available in multiple frequency bands including 2.3 – 2.6 Ghz and 4.9 – 6.4 GHz
- Wide range of models for different applications allowing end users to select the best-fit and most cost effective configuration
- Best-in-Class set of features including routing and switching capabilities
- Unrivalled robustness and reliability, guaranteeing smooth operation in the most challenging environments and in any part of the world

Solution Benefits

- Highly reliable and cost-effective solution
- Seamless integration into existing infrastructures and topologies
- Significant 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

InfiLINK Family Equipment

R5000-S

22 dBi integrated flat panel antenna Point-to-Point. "Pay as you grow" capacity from 12 Mbps to 36 Mbps net throughput

R5000-L

External antenna Point-to-Point. "Pay as you grow" capacity from 12 Mbps to 36 Mbps net throughput

The InfiMAN

Medium-capacity Point-to-Multipoint

Introduction



The InfiMAN range of products from InfiNet Wireless is a family of Point-to-Multipoint solutions designed for reliable connectivity, and available in both licensed and unlicensed frequency bands.

These solutions come with a number of powerful features that significantly enhance performance, such as unconditional media-applications traffic (VoIP, video, etc), prioritization of data types, flexible Quality-of-Service manager, etc., whilst still providing net throughputs of up to 34 Mbps throughput per base station Sector and operational distances in excess of 25 km.

The InfiMAN solutions are ideally suited for creating large city-wide or regional transmission and access networks, and have been

deployed by many of our customers around the world in campus-style topologies or for the connectivity of distant company branches or warehouses. They are an excellent choice for multi-site companies looking to improve efficiency and save costs by replacing legacy networking technologies or by moving away from traditional leased lines from their local operators.

Applications

Some typical applications of the InfiMAN family include:

- WISP and Operator's infrastructure
- Enterprise and Small Business networks
- Government, Banks, University and School networks
- CCTV and Video surveillance infrastructure
- Last-mile subscriber connectivity
- Cost-efficient rural connectivity

Product Key Features and Highlights

- Available in 2.3 – 2.6 GHz and 4.9 – 6.4 GHz
- "Pay as you grow" field-upgradeable capacity feature for Subscriber Terminals
- Up to 34 Mbps per Base Station Sector net throughput
- 5/10/20 MHz channel widths
- Operational distances in excess of 25 km
- LOS (line-of-sight) and NLOS (non-line-of-sight) operability
- Advanced Quality-of-Service Support
- Robust design

Solution Benefits

- Rapid & simple deployment
- Low entry cost and remote capacity upgrades
- Seamless integration into existing infrastructures
- Saving 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

InfiMAN Family Equipment

R5000-M

Integrated 60/90/120 deg sector antenna Base Station Sector. 34 Mbps net capacity, up to 27 dBm output power

R5000-O

External Antenna Base Station Sector. 34 Mbps net capacity, up to 27 dBm output power

R5000-Sc

22 dBi integrated flat panel antenna Subscriber Terminal. "Pay as you grow" capacity from 12 to 34 Mbps net throughput

R5000-Lc

External antenna Subscriber Terminal. "Pay as you grow" capacity from 12 to 34 Mbps net throughput

Applications

Infinet Wireless offers various types of end users a full range of feature-rich and cost effective solutions that are reliable, easy to deploy and fully scalable. Below are some examples of applications:

Carriers and Mobile Operators

Infinet Wireless provide various solutions for the challenging requirements of this market segment, ensuring that wireless service providers have the data capacity needed for both today's and tomorrow's growing bandwidth demands. To support the current convergence towards a complete Carrier Ethernet infrastructure, our product architecture utilises switching and routing functionality that combines circuit and data traffic from legacy base stations with native IP traffic. Our next-generation radio solutions have, in effect, removed the "air-interface" bottleneck that existed before and provide our users secure voice and data networks that are completely scalable, secure, and at the same time offer carrier-class reliability and are unaffected by harsh environmental conditions.

Corporate and SME Networks

In their most advanced configurations, our solutions are able to provide complete infrastructures that enable organisations of all types and sizes to connect their remote locations to either the headquarters or with each other (i.e. 'any to any' topology), ultimately allowing the simultaneous transmission of multi-protocol voice, video, and data across the entire network.

Wireless ISPs and Wireless Operators

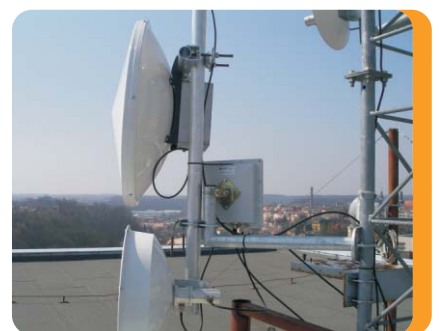
Today, dozens of Internet Service Providers (ISP's) in over 35 countries around the world use InfiNet Wireless equipment in their infrastructures to provide reliable transport and last mile access solutions. The largest of these ISP's are located in Russia, China, India, Spain, Italy, the UK, Malaysia, and more recently in the United States.

Video Surveillance and Traffic Management

InfiNet Wireless has many years of experience in this rapidly growing market and has already supplied highly reliable and secure video surveillance solutions to all corners of the world. In addition to providing complete transport solutions for video streams to public safety operators, InfiNet Wireless solutions have also been deployed in numerous other applications such as traffic signal/light monitoring, highway safety, ANPR (Automatic Number Plate Recognition) and road traffic management.

Energy and Natural Resources

Energy and mining companies which own critical and strategic infrastructures very often operate in some of the most remote areas and in the harshest climates of the world. From oil, mineral and ore extraction facilities to refineries and gas processing plants, InfiNet provides complete and robust solutions with high availability and reliability, and which are able to link physical facilities seamlessly wherever they are located, whether in a city centre or in the middle of a remote desert.



WISP/Telco Sector | Enforta, Russia

Objective

Provide multi-megabit Internet Access & VPN services to SME customers, including last mile delivery of data and voice.

Requirements

High reliability & availability, advanced QoS, time critical data prioritization, easy network integration, low Capex.

InfiNet's Solution

InfiMAN subsystems to collect/disperse traffic from/to customers and InfiLINK subsystems to backhaul to the Core network.

Traffic > 13 TeraBytes per month

> 650 Base stations

> 12,000 InfiNet CPEs



Transport and Logistics Sector | Port of Dakar, Senegal

Objective

Provide security coverage across the Dakar Port site in order to improve the control, access and health & safety processes throughout the facility.

Requirements

Cost-effective and reliable high capacity bandwidth links between remote, non-line of sight facility surveillance cameras. 24/7 high-reliability and uptime requirement for constant monitoring of security and public/employee safety.

InfiNet's Solution

InfiMan 2x2 products to support the majority of the pre-installed camera locations, where the throughput and distance support of the systems proved more than adequate for video transport, even when line-of-sight paths were partially obstructed. InfiNet's R5000-O and R5000-Om models were deployed as Base-station masters for the site. Where the link length was less than 30m, InfiNet's R5000-Smc was deployed to overcome the short-distance issues that are a common challenge with broadband wireless solutions.



Municipal Authorities Sector | Swindon Borough Council, UK

Objective

Provide a high capacity, flexible and scalable street-based CCTV video surveillance network to provide security for Swindon's citizens to deter crime and anti-social behaviour.

Requirements

Real time video distribution, integration with existing infrastructures, cost effectiveness, resilience, ability to evolve to support other types of traffic.

InfiNet's Solution

An extensive wide area network of InfiNet radios deployed in a range of network topologies, supporting more than 200 CCTV feeds routed to a single control centre.

InfiNet's IP-transport system tailored to requirements of UK's Crime and Disorder Act of 1998 Swindon was the first Council to implement wireless closed-circuit television (CCTV) surveillance as part of its crime reduction policy

Wide area network connectivity covering tens of square miles and supporting 200+ video cameras In-vehicles surveillance for public transport and emergency services vehicles.



Public Transportation Sector | Railway Operator, Ferrotramviaria SpA, Italy

Objective

Provide broadband wireless connectivity supporting video, video surveillance, voice and data traffic between its 13 stations, and between those stations & trains, in the North Bari area.

Requirements

Reduce operational costs compared with existing leased lines, guaranteed bandwidth and QoS, very high availability, remote administration, real-time train driver/control room communications, automatic failover between radio and an SHDSL network.

InfiNet's Solution

A main backbone using single and dual InfiMAN radios providing more than enough bandwidth to handle the planned and future requirements.



T@WAN - Terengganu Broadband Network, Malaysia

Objective

The State Government of Terengganu built the project as part of the plan to develop the State and attract foreign investment into the Eastern State of Malaysia. T@WAN involves the building of a wireless broadband infrastructure, starting from the north at Besut town to the south in Kemaman town, to interconnect all the District Government offices, Commercial Centers, Bestari.Comm Centers, various Government Agency buildings and mosques to the ICT Center in Kuala Terengganu, the capital city of the State.

Requirements

High Speed, Long distance PTP, PTMP and WIFI network infrastructure that is secure and resilient and yet cost-effective.

InfiNet's Solution

Several high-speed InfiLINK in PTP topology and large InfiMAN PTMP configurations scattered across the State to provide internet connection as well as data and voice communication between all the respective end-points.



Oil & Gas | Russia & Saudi Arabia

Objective

Provide a secure data and voice connection, interconnect oil rigs, processing facilities to branch offices and gas stations.

Requirements

Long distance, cost effective, resilient, able to grow the network, low in maintenance, ruggedized.

InfiNet's Solution

A mixture of InfiLINK's Point-to-point solution and InfiMAN's support for Point-to-MultiPoint networks was deployed with some in very diverse environments. Recently, video surveillance and SCADA applications were deployed to run over InfiNet Wireless systems.

Corporate VPN connecting branch offices, oil processing facilities, gas stations

Distances up to 40km @2.4 GHz; including over-the-water connectivity to rigs

Point-to-Multipoint topology connecting tens of remote oil drilling sites

Coverage radius >17km



Municipal Authorities Sector | Rio de Janeiro, Brazil

Objective

The State of Rio de Janeiro has made the decision to deploy a new wireless broadband network specifically to support existing CCTV and newly-expanding IP surveillance systems. The project has the aim of delivering high-resolution Surveillance and Imaging services to police and local government bodies, helping to boost the response times and operational efficiency of emergency and security services, whilst offering coverage into new areas which are often challenging to police on a public security basis.

Requirements

To deliver a scalable and cost-effective IP-based solution for next-generation CCTV and surveillance systems across 26 targetted areas of the city within a 12 month timeframe that will be capable of supporting additional networking and communications services for the 2016 Olympic Games.

InfiNet's Solution

InfiMan 2x2 MIMO high capacity, point-to-multipoint wireless technology to provide the wireless infrastructure that would serve the city's surveillance and safety network.



Enterprise Sector | Bank of China

Objective

Link a regional Head Office and 26 Local Branch Offices, across a wide geographical area, with a high bandwidth VPN to transport voice, email, secure data and ATM traffic.

Requirements

High security, very high availability, interfacing to existing bank infrastructure.

InfiNet's Solution

A range of Point-to-Multipoint InfiMAN Base Stations connected to InfiLINK Point to Point R5000 elements, with bandwidths selected appropriate to the traffic to be transported.



WISP Sector | Manchester Metronet, UK

Objective

The Manchester Metronet network is a pure IP-based infrastructure providing wireless internet connectivity for various types of end users . As well as targeting corporate data clients for broadband access and wide area networking connectivity, Metronet engages with local Police and Council Authorities to promote the use of its network infrastructure to support wireless CCTV video and ANPR (Automatic Number Plate Recognition) camera systems.

Requirements

Among many Metronet's challenges, the main one was to cater for support of varying profiles and types of traffic, including IP Voice (VoIP) traffic, video conferencing, high-bandwidth corporate database and IP surveillance, where low-latency wireless networks that are capable of supporting PTZ-controlled surveillance systems are also important factors.

InfiNet's Solution

- Metronet uses highly secure IP radio connections through InfiNet Wireless' transmission techniques to provide optimal quality of service and ensure that the connection is inherently secure;
- Techniques include leading-edge encryption and frequency hopping around 80 different channels, with random changes being performed every second.



4

PRODUCT FEATURES

Software Features, Protocols and Algorithms of InfiNet Wireless Equipment

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

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

GENERAL FEATURES

- Frequency / IP - roaming for CPE between Base Stations
- Automatic over - the - air firmware upgrade

MAC

- **Dynamic adaptive Polling**
 - Solving "hidden node" problems and optimizing performance in Point-to-Multipoint topologies
 - Centralized marker grant mode
 - Dynamically takes into account channel activity
 - Permanent channel testing
- **ARP protocol support**
- **MAC/IP filtering**
- **Full-fledged 2nd layer 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
- **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**

NETWORKING

- **Ethernet-over-IP tunneling**
- **ARP protocol support**
- **MAC/IP filtering**
- **Full-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**

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
 - SNMP Traps
 - serial port
 - remote shell
- **SNMPv1 / SNMPv3 support** (MIB II, private MIB)
- **Configurable SNMP Traps**

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**

SECURITY FEATURES

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

	Description	Capacity	Wired Interfaces	Frequency Bands / MAX Output power	Antenna
InfiLINK 2x2 HIGH CAPACITY POINT-TO-POINT					
R5000-Mmx	High-capacity 40/80/150/300 Mbps Integrated Antenna Point-to-Point backhaul	40, 80, 150 and 300 Mbps (license upgradeable)	<ul style="list-style-type: none"> Gigabit Ethernet port (10/100/1000 Base-T) RJ-45 connector Serial port (RS-232) 	4.9-6.0 GHz up to 23 dBm	23 or 28 dBi dual-pol integrated flat panel antenna
R5000-Omx	High-capacity 40/80/150/300 Mbps External Antenna Point-to-Point backhaul	40, 80, 150 and 300 Mbps (license upgradeable)	<ul style="list-style-type: none"> Gigabit Ethernet port (10/100/1000 Base-T) RJ-45 connector Serial port (RS-232) 	2.3-2.6 GHz 4.9-6.4 GHz up to 18 or 23 dBm (model-dependent)	External antenna
R5000-Sm	35/50 Mbps Integrated Antenna Backhaul	35 and 50 Mbps (license upgradeable)	<ul style="list-style-type: none"> Fast Ethernet port (10/100 Base-T) RJ-45 connector Serial port (RS-232) 	4.9-6.0 GHz up to 18 dBm	23 dBi dual-pol integrated flat panel antenna
R5000-Lm	35/50 Mbps External Antenna Backhaul	35 and 50 Mbps (license upgradeable)	<ul style="list-style-type: none"> Fast Ethernet port (10/100 Base-T) RJ-45 connector Serial port (RS-232) 	2.3-2.6 GHz 4.9-6.4 GHz up to 18 dBm	External antenna
InfiLINK 2x2 3.5 GHz HIGH CAPACITY POINT-TO-POINT					
R5000-Mmx	High-capacity 40/80/150/300 Mbps Integrated Antenna Point-to-Point backhaul	40, 80, 150 and 300 Mbps (license upgradeable)	<ul style="list-style-type: none"> Gigabit Ethernet port (10/100/1000 Base-T) RJ-45 connector Serial port (RS-232) 	3.4-3.7 GHz up to 23 dBm	22 dBi dual-pol integrated flat panel antenna
R5000-Omx	High-capacity 40/80/150/300 Mbps External Antenna Point-to-Point backhaul	40, 80, 150 and 300 Mbps (license upgradeable)	<ul style="list-style-type: none"> Gigabit Ethernet port (10/100/1000 Base-T) RJ-45 connector Serial port (RS-232) 	3.4-3.7 GHz up to 23 dBm	External antenna
InfiLINK MEDIUM CAPACITY POINT-TO-POINT					
R5000-S	Medium-capacity 12/36 Mbps Integrated 22 dBi Flat Panel Antenna Point-to-Point backhaul	12 and 36 Mbps (license upgradeable)	<ul style="list-style-type: none"> Fast Ethernet port (10/100 Base-T) RJ-45 connector Serial port (RS-232) 	4.9-6.4 GHz up to 18 dBm	22 dBi integrated flat panel antenna
R5000-L	Medium-capacity 12/36 Mbps External Antenna Point-to-Point backhaul	12 and 36 Mbps (license upgradeable)	<ul style="list-style-type: none"> Fast Ethernet port (10/100 Base-T) RJ-45 connector Serial port (RS-232) 	2.3-2.6 GHz 4.9-6.4 GHz up to 18 dBm	External antenna
InfiMAN 2x2 HIGH CAPACITY POINT-TO-MULTIPOINT					
R5000-Mmx	High-capacity Integrated Sector Antenna Base-Station	40, 80, 150 and 300 Mbps (license upgradeable)	<ul style="list-style-type: none"> Gigabit Ethernet port (10/100/1000 Base-T) RJ-45 connector Serial port (RS-232) 	4.9-6.0 GHz up to 18 or 23 dBm (model-dependent)	16 dBi dual-pol integrated 90 deg sector antenna
R5000-Omx	High-capacity External Antenna Base-Station	40, 80, 150 and 300 Mbps (license upgradeable)	<ul style="list-style-type: none"> Gigabit Ethernet port (10/100/1000 Base-T) RJ-45 connector Serial port (RS-232) 	2.3-2.6 GHz 4.9-6.4 GHz up to 18 or 23 dBm (model-dependent)	External antenna
R5000-Smc	High-capacity Integrated Antenna Subscriber Terminal	4, 8, 12, 20 and 35 Mbps throughput options (license upgradeable)	<ul style="list-style-type: none"> Fast Ethernet port (10/100 Base-T) RJ-45 connector Serial port (RS-232) 	4.9-5.9 GHz up to 18 dBm	21 dBi dual-pol integrated flat panel antenna
R5000-Lmc	High-capacity External Antenna Subscriber Terminal	4, 8, 12, 20 and 35 Mbps throughput options (license upgradeable)	<ul style="list-style-type: none"> Fast Ethernet port (10/100 Base-T) RJ-45 connector Serial port (RS-232) 	2.3-2.6 GHz 4.9-6.1 GHz up to 18 dBm	External antenna
InfiMAN 2x2 3.5 GHz HIGH CAPACITY POINT-TO-MULTIPOINT					
R5000-Omxb	High-capacity External Antenna Base-Station	40, 80, 150 and 300 Mbps (license upgradeable)	<ul style="list-style-type: none"> Gigabit Ethernet port (10/100/1000 Base-T) RJ-45 connector Serial port (RS-232) 	3.4-3.7 GHz up to 23 dBm	External antenna
R5000-Smc	High-capacity Integrated Antenna Subscriber Terminal	1, 4, 8, 12 and 20 Mbps (license upgradeable)	<ul style="list-style-type: none"> Fast Ethernet port (10/100 Base-T) RJ-45 connector Serial port (RS-232) 	3.4-3.7 GHz up to 23 dBm	22 dBi dual-pol integrated flat panel antenna
R5000-Lmc	High-capacity External Antenna Subscriber Terminal	1, 4, 8, 12 and 20 Mbps (license upgradeable)	<ul style="list-style-type: none"> Fast Ethernet port (10/100 Base-T) RJ-45 connector Serial port (RS-232) 	3.4-3.7 GHz up to 23 dBm	External antenna
InfiMAN MEDIUM CAPACITY POINT-TO-MULTIPOINT					
R5000-M	Medium-capacity Integrated Antenna Base Station sector	34 Mbps sector capacity	<ul style="list-style-type: none"> Fast Ethernet port (10/100 Base-T) RJ-45 connector Serial port (RS-232) 	4.9-6.4 GHz up to 27 dBm	17/16/15 dBi integrated sector antenna 60/ 90/120 deg
R5000-O	Medium-capacity External Antenna Base Station sector	34 Mbps sector capacity	<ul style="list-style-type: none"> Fast Ethernet port (10/100 Base-T) RJ-45 connector Serial port (RS-232) 	2.3-2.6 GHz 4.9-6.4 GHz up to 27 dBm	External antenna
R5000-Sc	Medium-capacity Integrated Antenna Subscriber Terminal	12 and 34 Mbps (license upgradeable)	<ul style="list-style-type: none"> Fast Ethernet port (10/100 Base-T) RJ-45 connector Serial port (RS-232) 	4.9-6.4 GHz up to 18 dBm	Integrated 22 dBi flat panel antenna
R5000-Lc	Medium-capacity External Antenna Subscriber Terminal	12 and 34 Mbps (license upgradeable)	<ul style="list-style-type: none"> Fast Ethernet port (10/100 Base-T) RJ-45 connector Serial port (RS-232) 	2.3-2.6 GHz 4.9-6.4 GHz up to 18 dBm	External antenna



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