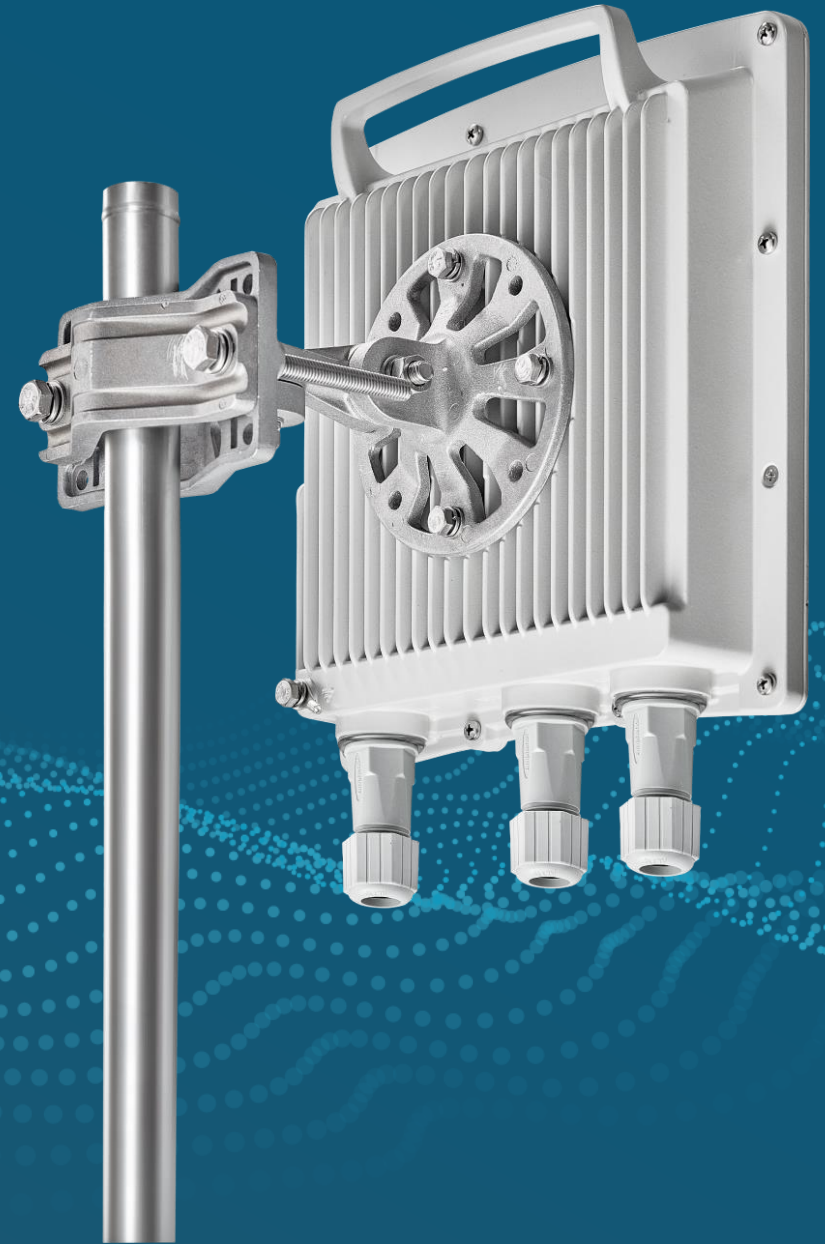




# Evolution families

Reliable wireless solutions in 4.9-6.4 GHz bands with advanced network functionality

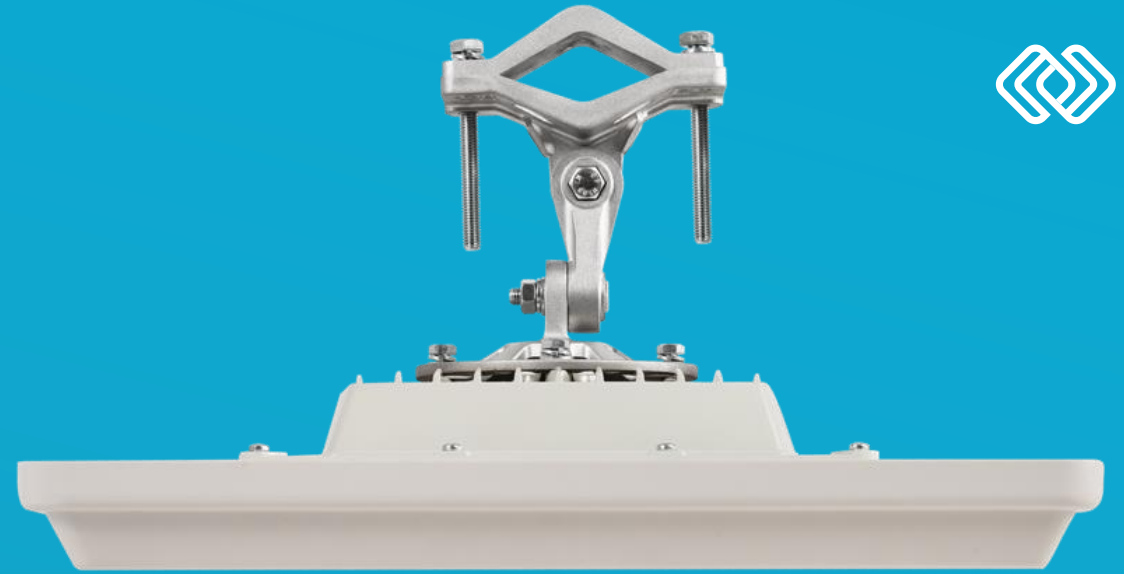


# About

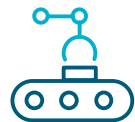


## Infinet Wireless

The world's leading developer and manufacturer of Broadband Wireless Access solutions which are used to create carrier-grade wireless backbones and access networks for service providers



More than **500,000** deployments in over **130** countries



**2,500** square meters of own production facilities



**180** employees



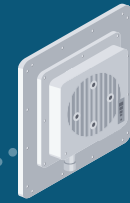
**30** offices around the world, in strategically important countries



**100+** major distributors all over the world



**InfiLINK Evolution**



**InfiMAN Evolution**

## Evolution families

**Evolution** is the next generation of Point-to-Point and Point-to-Multipoint wireless solutions, the extension of the field-proven R5000 families.

The Evolution families provide capacity of up to 800 Mbps in the 5 GHz and 5+6 GHz frequency bands, making it an attractive solution for businesses of any sizes.



## InfiLINK Evolution family

**InfiLINK Evolution** is an advanced Point-to-Point solution operating in 4.9–6.4 GHz frequency bands with a large set of network functions for high-performance last mile access.

InfiLINK Evolution offers a unique combination of high performance up to 670 Mbps in 80 MHz band, availability and ease of installation.



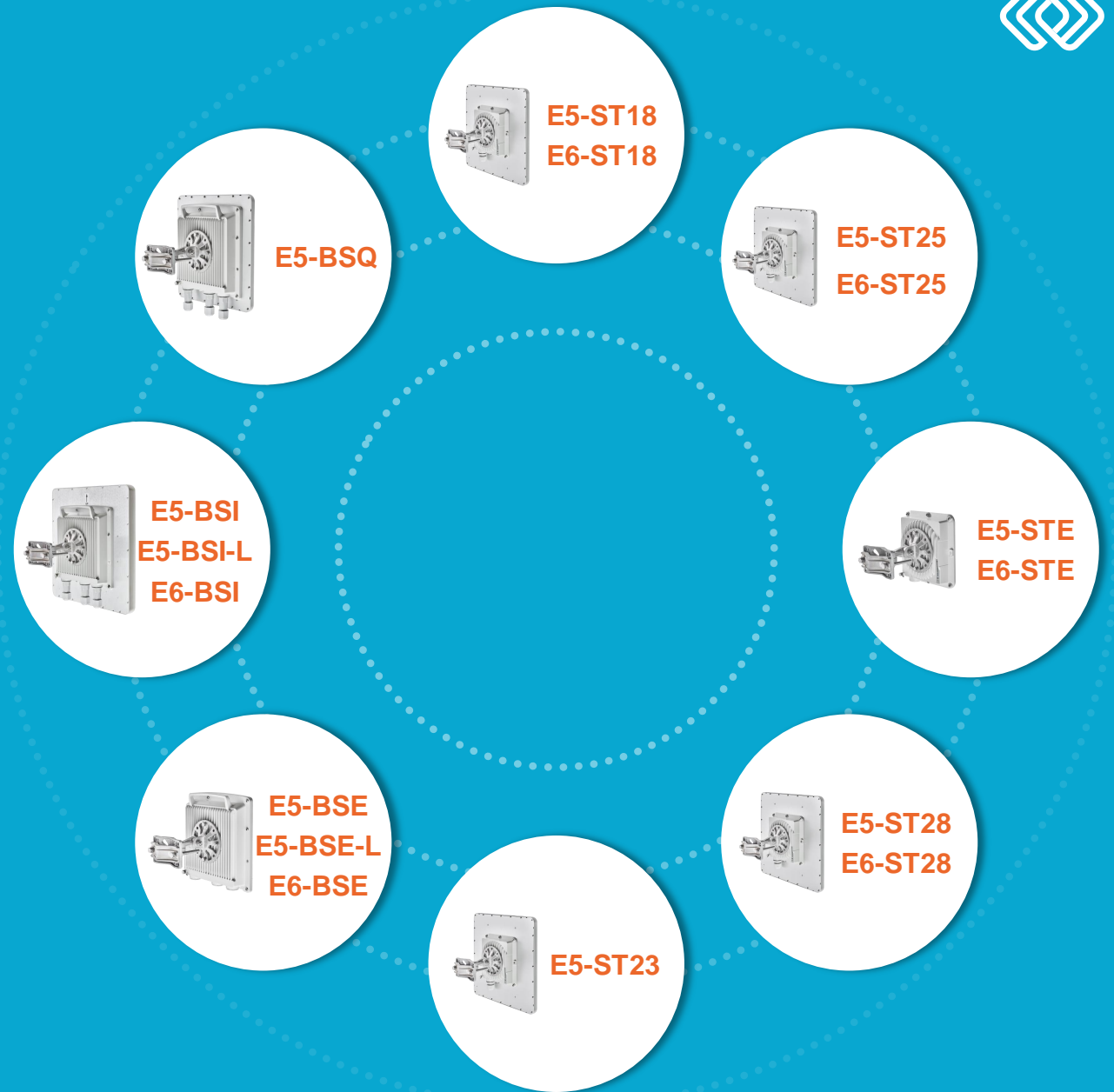


## InfiMAN Evolution family

**InfiMAN Evolution** is designed thanks to a combination of innovative technology, high reliability and the advanced functionality of the field-proven InfiMAN 2x2 family.

InfiMAN Evolution wireless solutions are ideal for deployment in Point-to-Multipoint network topologies where there is a need to connect seamlessly fixed locations, as well as nomadic and mobile units to central points of presence.

The new base station provides, among many other things, a sector capacity of up to 800 Mbps, enabling wireless operators of all sizes not only to deploy new infrastructures but also to extend the reach of their existing networks, all whilst providing full backward compatibility with Infinet's previous generation of wireless systems.



# Key features



Single system covering multiple bands

Evolution devices operate in 4.9–6.4 GHz frequency bands, which allows to use the same devices in the 5 and 6 GHz bands

Security

The proprietary protocol usage for the radio link organization makes unauthorized access to radio and data decryption difficult in case of interception

Built-in radio channel diagnostic tools

The devices are equipped with built-in radio channel diagnostics tools, such as spectrum analyzer, antenna alignment tool and radio scanner, available in the user web interface

# Key features



## Automatic adjustment mechanisms

Automatic adjustment mechanisms are implemented for the following parameters:

- transmitted power
- bitrate
- UL/DL ratio

## Beamforming\*

Beamforming technology allows to increase the wireless link performance by reducing the interference impact and increasing the link budget

## Compatibility with R5000

Compatibility with R5000 makes it possible to seamlessly upgrade the network and hop to Evolution families

## Instant DFS

Evolution devices continuously perform background spectrum monitoring and seamlessly change channel to the least noisy frequency without link interruption, taking into account the spectrum conditions at the location of all connected devices

\* Only for InfiMAN Evolution

# Technical Specifications



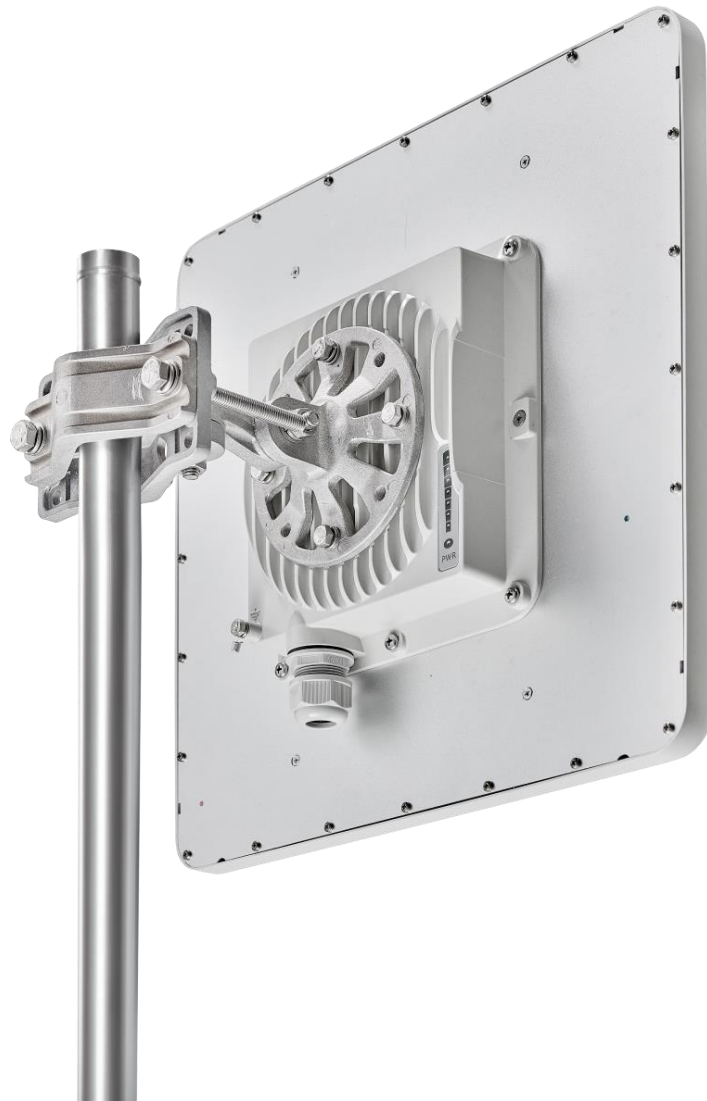
Modulation	MIMO 2x2 (OFDM 64/128)
Modulation coding schemes	10 MCS, from BPSK 1/2 to QAM256 5/6
Frequency range	4900–6050 MHz* 4900–6425 MHz*
Channel width	20, 40, 80 MHz 20, 40 MHz**
Center frequency adjustment step	125 kHz
Transmit power	up to 27 dBm
Receiver sensitivity	down to -93 dBm
Duplex scheme	TDD
Antenna	Integrated dual polarization flat panel 16, 18, 21, 23, 25 and 28 dBi* 2x type-N connectors for external dual polarization antenna
Maximal range	up to 100+ km
Air frame	from 2 to 10 ms
Proprietary technologies	Instant DFS, Beamforming

\* Depends on family and model

\*\* For the models E5-BSI-L, E5-BSE-L



# InfiLINK Evolution Advantages



- InfiLINK Evolution can be used in both 5 GHz and 6 GHz bands thanks to the support of wide range frequencies
- The TDMA technology used in InfiLINK Evolution eliminates hidden node collisions and maximizes airtime efficiency that provides performance improvements in latency, noise immunity and scalability
- Air frame range allows to control payload transmission and latency, especially for latency sensitive applications like PTZ cameras, IPTV, etc.

# InfiMAN Evolution Advantages








- InfiMAN Evolution can be used in both 5 GHz and 6 GHz bands thanks to the support of wide frequency ranges
- The ability to tune the air frame duration allows to adjust the balance between performance and latency for different services
- Beamforming technology reduces the interference impact and increases the link budget
- The TDMA technology used in InfiMAN Evolution eliminates hidden node collisions and maximizes airtime efficiency that provides performance improvements in latency, noise immunity and scalability



# InfiLINK Evolution Link budget

InfiLINK Evolution indicates the high link budget values. Such values allow to achieve maximum performance at the distances in excess of 15 km with integrated antennas whereas with connectorized version at distances even more than 60 km.

Model	Antenna gain, dBi	Link budget, dB	Recommended distance, km
 E5-ST18 E6-ST18	18	up to 152	up to 3
 E5-ST23	23	up to 162	up to 7
 E5-ST25 E6-ST25	25	up to 166	up to 10
 E5-ST28 E6-ST28	28	up to 172	up to 15
 E5-STE E6-STE	-	from 116	60+




# InfiMAN Evolution Link budget

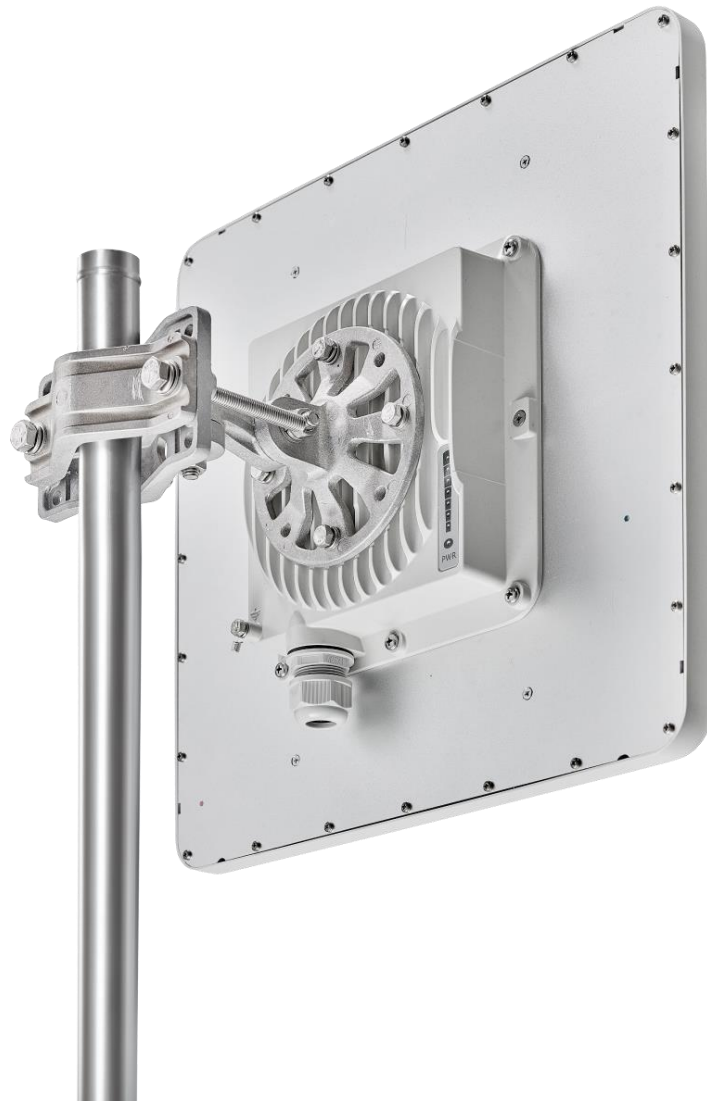
InfiMAN Evolution subscriber terminals allow to deploy last mile channels up to 60 km, depending on the project requirements.

The base station sector E5-BSQ with beamforming technology guarantees better performance compared to the other family models due to better noise immunity and link budget increase by 4 dB.

In the scenarios of using antennas with the radiation pattern width other than 90 degrees, devices with the ability to connect an external antenna are in demand. Such installations allow to increase coverage area and connection density, providing higher throughput to demanding customers.

Model BS	Model ST	Recommended distance, km
 <p>E5-BSQ</p>	 <p>E5-ST18 E6-ST18</p>	up to 3
 <p>E5-BSI E6-BSI</p>	 <p>E5-ST23</p>	up to 7
 <p>E5-BSE E6-BSE</p>	 <p>E5-ST25 E6-ST25</p>	up to 10
	 <p>E5-ST28 E6-ST28</p>	up to 15
	 <p>E5-STE E6-STE</p>	60+

# InfiLINK Evolution Advantages



- Available with a wide range of integrated antennas 18, 23, 25 and 28 dBi, as well as a connectorized version for using with 3rd party external antennas, the InfiLINK Evolution family is the ideal choice for a large array of applications
- The high link budget allows to reduce the interference impact and achieve maximum performance in the severe interference environment

# InfiMAN Evolution Advantages



- Available with a range of integrated antennas 16 and 21 dBi, as well as a connectorized version for using with 3rd party external antennae, the InfiMAN Evolution base station sectors are the ideal choice for a large array of applications
- The high link budget allows to reduce the interference impact and achieve maximum performance in the severe interference environment

# Performance



The Evolution families packet performance allows to achieve throughput of up to 800 Mbps and meet various services quality requirements, including real-time services.



## Packet performance

up to 180 000 pps\*  
up to 290 000 pps\*\*

## Throughput

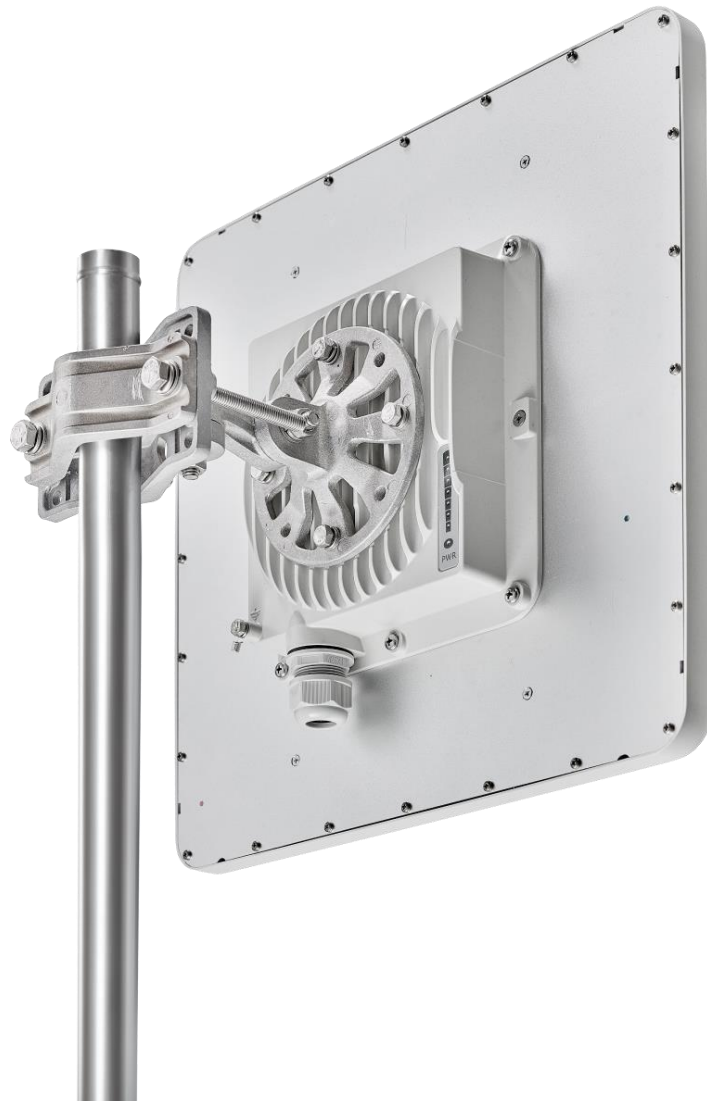
up to 670 Mbps\*  
up to 800 Mbps\*\*  
up to 360 Mbps\*\*\*

\* For InfiLINK Evolution and InfiMAN Evolution ST

\*\* For InfiMAN Evolution BS

\*\*\* For the models E5-BSI-L, E5-BSE-L

# InfiLINK Evolution Advantages



- The spectrum allocated to the link is used by the InfiLINK Evolution family with maximum performance due to the spectral efficiency of 8.375 bit/s/Hz
- InfiLINK Evolution performance reaches 670 Mbps which meets the needs of most last mile links, trunk channels of the light and medium networks



# InfiMAN Evolution Advantages



- InfiMAN Evolution performance reaches 800 Mbps which meets the needs of most last mile links, trunk channels of the light and medium networks
- Cost-effective base station for low-density sectors



# Network Functionality

Evolution families support a wide range of network functions which are in demand in various network scenarios.



## Switching

- VLAN
- Q-in-Q
- STP



## Routing

- RIP
- OSPF
- L2 and L3 tunneling



## Security

- L2 and L3 Firewall
- SSH and HTTPS
- SNMP v3



## QoS

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

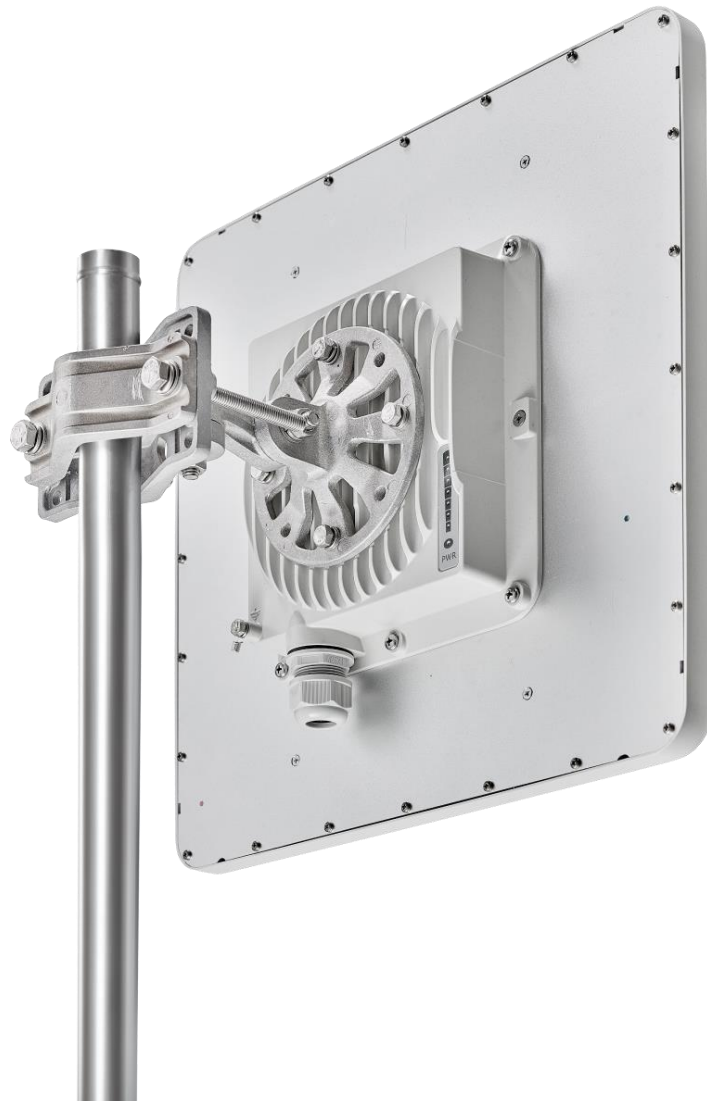


## Additional functions

- NAT
- DHCP (client/server/relay)
- Optical and copper ports\*

\* For InfiMAN Evolution

# InfiLINK Evolution Advantages



InfiLINK Evolution supports a wide range of network functionality, which is in demand in many network scenarios:

- Q-in-Q technologies, tunneling and dynamic routing protocols are implemented for trunk channels
- 17 queues support allows to perform flexible traffic shaping between end subscribers
- Traffic shaping option performs flexible traffic redistribution for critical services providing them with guaranteed throughput
- Last mile security is ensured by the ability to configure Firewall on L2 and L3 layers

# InfiMAN Evolution Advantages



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- 17 queues support allows to perform flexible traffic shaping between end subscribers
- Traffic shaping option performs flexible traffic redistribution for critical services providing them with guaranteed throughput
- Last mile security is ensured by the ability to configure Firewall on L2 and L3 layers

# Security options



Thanks to a built-in rich security features, traffic security is under full control.



## Management

HTTPS, SSH, SNMP v3

## Radio security

Security Key, Scrambling, Network SID, Authentication Mode, Max links, Global function

## Authentication

Password protection, RADIUS

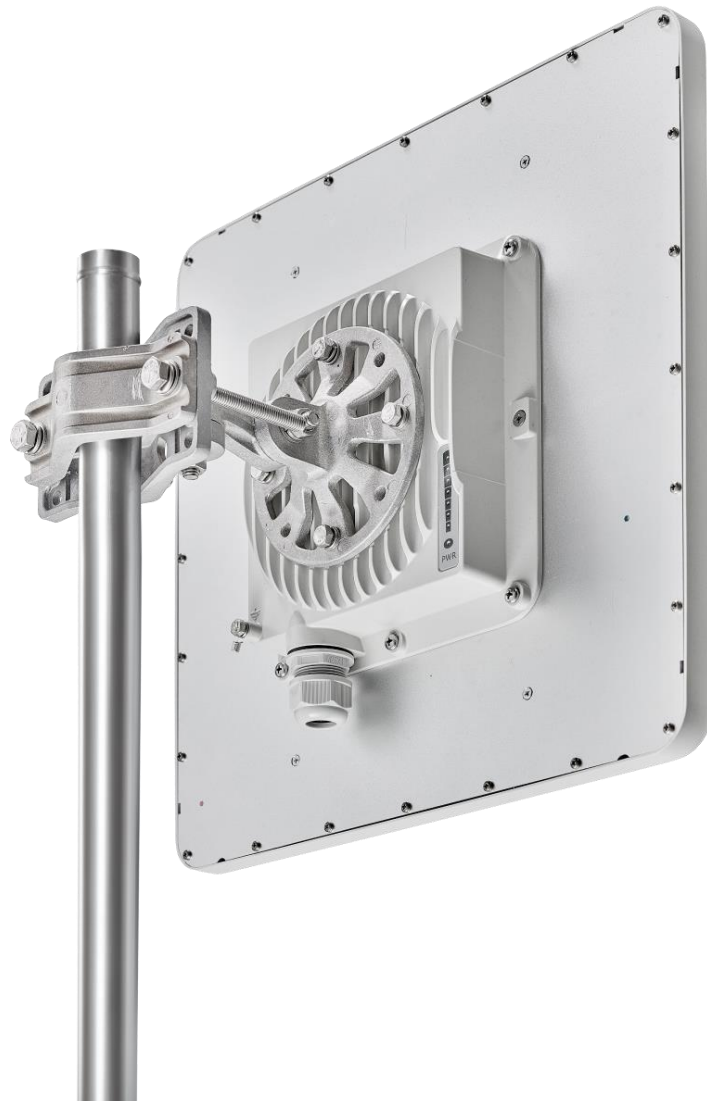
## Syslog

Supported

## Access limitation

Access whitelist

# InfiLINK Evolution Advantages



- Wireless connection is fully secured using a reach number of features that reduce scenarios of link establishment with an attacker's device
- Secure web and command-line access via HTTPS and SSH protocols
- Centralized authentication, authorization and account management using the RADIUS protocol
- Access to the management interface limitation using an access whitelist option

# InfiMAN Evolution Advantages



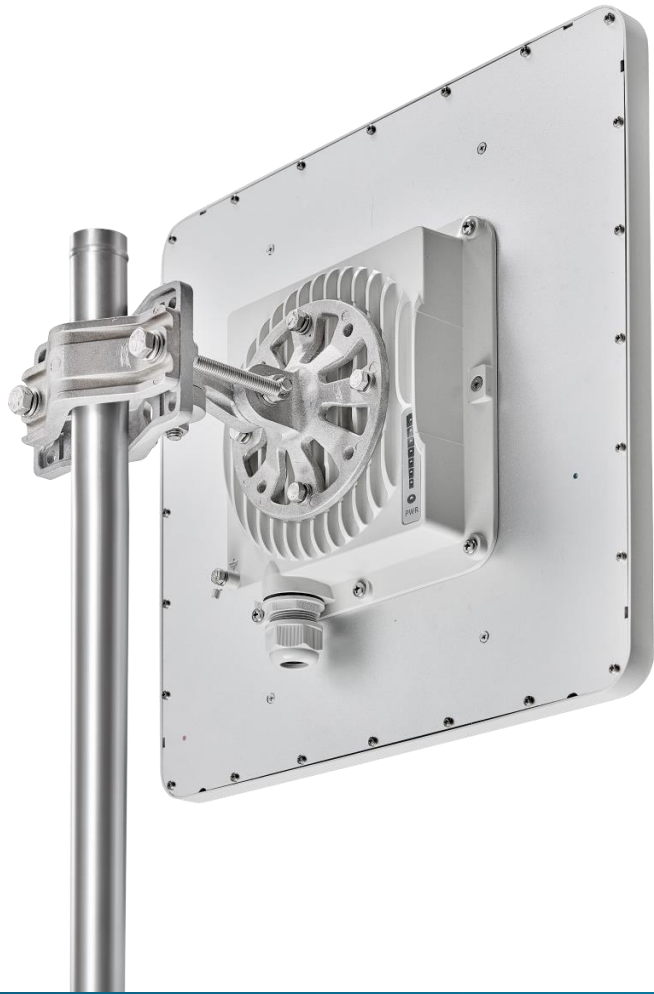
- Wireless connection is fully secured using a reach number of features that reduce scenarios of link establishment with an attacker's device
- Secure web and command-line access via HTTPS and SSH protocols
- Centralized authentication, authorization and account management using the RADIUS protocol
- Access to the management interface limitation using an access whitelist option



# Operation



The wireless link reliability and performance depend on the installation and alignment quality. The adjustment can be performed using the MONT-KIT-85 mounting kit and the LED indication on the device case.



High-precision azimuth and elevation adjustment

Mounting kit with horizontal and vertical alignment



RSSI level, power, wired and wireless link indicator

The power status, wired and wireless link status, RSSI level LED indication on the device case





# Operation subsystem Specification



## InfiLINK Evolution InfiMAN Evolution ST

## InfiMAN Evolution BS

Operating temperature range

from -40 °C to +60 °C  
from -55 °C to +60 °C

Dust and water protection

IP66  
IP67

Wind load

160 km/h – operational  
200 km/h – survival

Power supply

IDU-CPE-G(24W)  
IDU-BS-G (60W)  
IDU-LA-G(V.01)  
AUX-ODU-INJ-G

IDU-BS-G (60W)  
IDU-LA-G(V.01)  
AUX-ODU-INJ-G

PoE

802.3at  
proprietary passive PoE

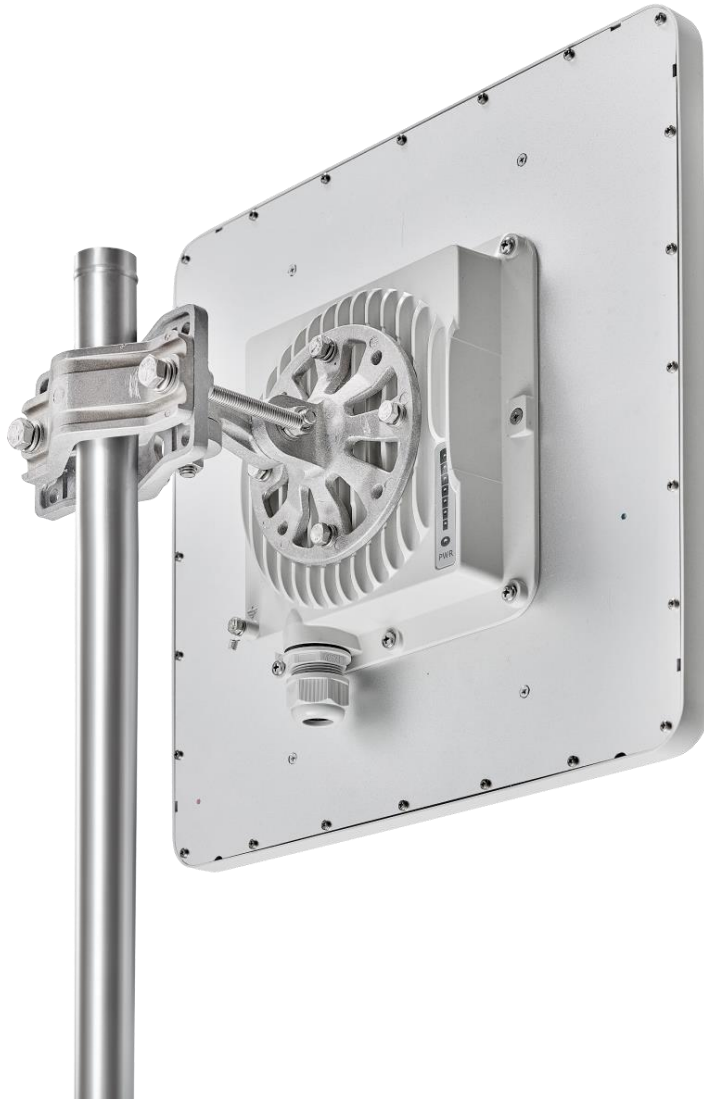
Power consumption

up to 15 W

up to 30 W

\* Models with “t” index in PN

# InfiLINK Evolution Advantages



- The wide temperature range and compliance with IP66 and IP67 allow to deploy reliable wireless links in adverse climatic conditions
- Built-in lightning protection increases reliability and InfiLINK Evolution devices durability



# InfiMAN Evolution Advantages



- The wide temperature range and compliance with IP66 and IP67 allow to deploy reliable wireless links in adverse climatic conditions
- Built-in lightning protection increases reliability and InfiMAN Evolution devices durability




# InfiLINK Evolution Models Configuration

Models	E5-ST18 E6-ST18	E5-ST23	E5-ST25 E6-ST25	E5-ST28 E6-ST28	E5-STE E6-STE
Frequency range	E5: 4900–6050 MHz E6: 4900–6425 MHz				
Antenna gain   Beamwidth	18 dBi 18 x 18 deg	23 dBi 10 x 10 deg	25 dBi 8 x 8 deg	28 dBi 5 x 5 deg	external
Size and weight	188 x 188 x 45 mm 1.3 kg	305 x 305 x 66 mm 1.75 kg	350 x 350 x 71,5 mm 2.3 kg	600 x 600 x 68 mm 5.8 kg	180 x 190 x 86 mm 1.2 kg
Wired interfaces	1xGE(RJ45)				



# InfiMAN Evolution BS Models Configuration

	E5-BSQ	E5-BSI E6-BSI	E5-BSE E6-BSE	E5-BSI-L	E5-BSE-L
Models					
Frequency range			E5: 4900–6050 MHz E6: 6050–6425 MHz		
Antenna gain   Beamwidth	21 dBi 90 x 8 deg (20 deg Az-steerable beam)	16 dBi 90 x 8 deg	external	16 dBi 90 x 8 deg	external
Size and weight	371 x 371 x 90 mm 4.4 kg	371 x 371 x 90 mm 4.4 kg	240 x 248 x 87 mm 2.2 kg	371 x 371 x 90 mm 4.4 kg	240 x 248 x 87 mm 2.2 kg
Wired interfaces			1xGE(RJ45), 1xSFP, 1xSYNC		



# InfiMAN Evolution ST Models Configuration

Models	E5-ST18 E6-ST18	E5-ST23	E5-ST25 E6-ST25	E5-ST28 E6-ST28	E5-STE E6-STE
Frequency range	E5: 4900–6050 MHz E6: 4900–6425 MHz				
Antenna gain   Beamwidth	18 dBi 18 x 18 deg	23 dBi 10 x 10 deg	25 dBi 8 x 8 deg	28 dBi 5 x 5 deg	external
Size and weight	188 x 188 x 45 mm 1.3 kg	305 x 305 x 66 mm 1.75 kg	350 x 350 x 71.5 mm 2.3 kg	600 x 600 x 68 mm 5.8 kg	180 x 190 x 86 mm 1.2 kg
Wired interfaces	1xGE(RJ45)				





# Application



## Last mile connectivity for telecom operators

The devices are in demand in the last mile scenarios for telecom operators subscribers due to the following features:

- prioritization and traffic limiting support for different services types
- IGMP support for IPTV



## Last mile for enterprise networks

Routing functions support allows to use Evolution in the last mile scenarios in enterprise networks. The following features are available:

- dynamic and static routing
- NAT
- Q-in-Q
- QoS
- L2 and L3 tunneling



## Trunk channels of telecom operators

The devices are in demand in the trunk channels scenarios for telecom operators due to the following features:

- dynamic and static routing
- tunnels organization
- QoS



## Video surveillance

Different security levels features support allows to compensate the limited video cameras security settings. Thanks to this, the Evolution can be effectively used in video surveillance scenarios.

The security is ensured by configuring the following features:

- data transfer tunnels
- Firewall
- access list



# Comparison with R5000

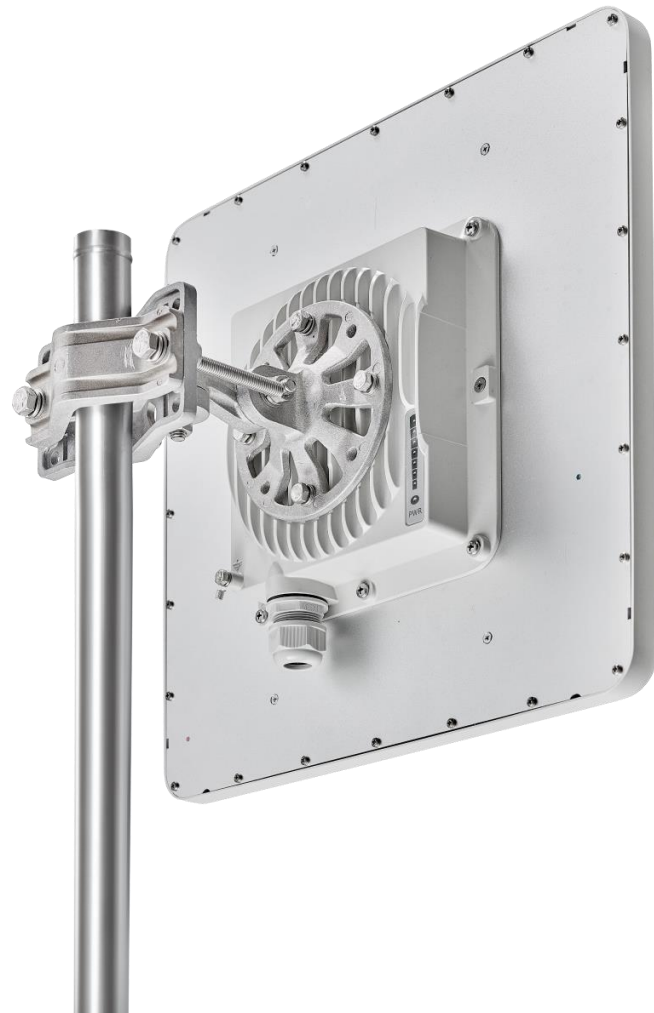
Parameter		InfiLINK 2x2 PRO	InfiLINK Evolution	InfiMAN 2x2	InfiMAN Evolution
Frequency range, MHz		4900–6050 6050–6425	4900–6050 4900–6425	4900–6050 6050–6425	ST, BS: 4900–6050 BS: 6050–6425 ST: 4900–6425
Channel width, MHz		5, 10, 20, 40	20, 40, 80	5, 10, 20, 40	20, 40, 80
Transmit power, dBm		up to 27	up to 25	up to 27	up to 27
Modulation coding schemes		up to QAM64 5/6	up to QAM256 5/6	up to QAM64 5/6	up to QAM256 5/6
Packet performance, pps		200 000	180 000	ST: 90 000 BS: 200 000	ST: 180 000 BS: 290 000
Throughput, Mbps	40 MHz	up to 280	up to 335	up to 250	up to 360
	Max value	up to 280	up to 670	up to 250	up to 800





# Evolution families Advantages

The Evolution families are the next step in the development of the R5000 which has achieved the advantages described below.



Single system covering multiple bands

Evolution devices operate in 4.9–6.4 GHz frequency bands, which allows to use the same devices in the 5 and 6 GHz bands

Modulation coding schemes

All Evolution devices support the QAM256 5/6 modulation-code scheme allowing to get a performance advantage of up to 30% compared to the R5000

Channel width increase

The ability to operate in the 80 MHz band increases the Evolution devices performance twice compared to R5000






Compatibility with R5000

Compatibility with R5000 makes it possible to seamlessly upgrade the network and hop to Evolution families



# IW Ecosystem

Infinet Wireless develops services to make the process of interaction with the Evolution families as simple and convenient as possible. These services are designed to support all stages of product operation.

	Planning	Deployment	Operation
 Service Desk	✓	✓	✓
 InfiPLANNER	✓	✓	
 InfiMONITOR			✓
 IW Academy	✓	✓	✓
 Mobile App	✓	✓	✓



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wireless



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