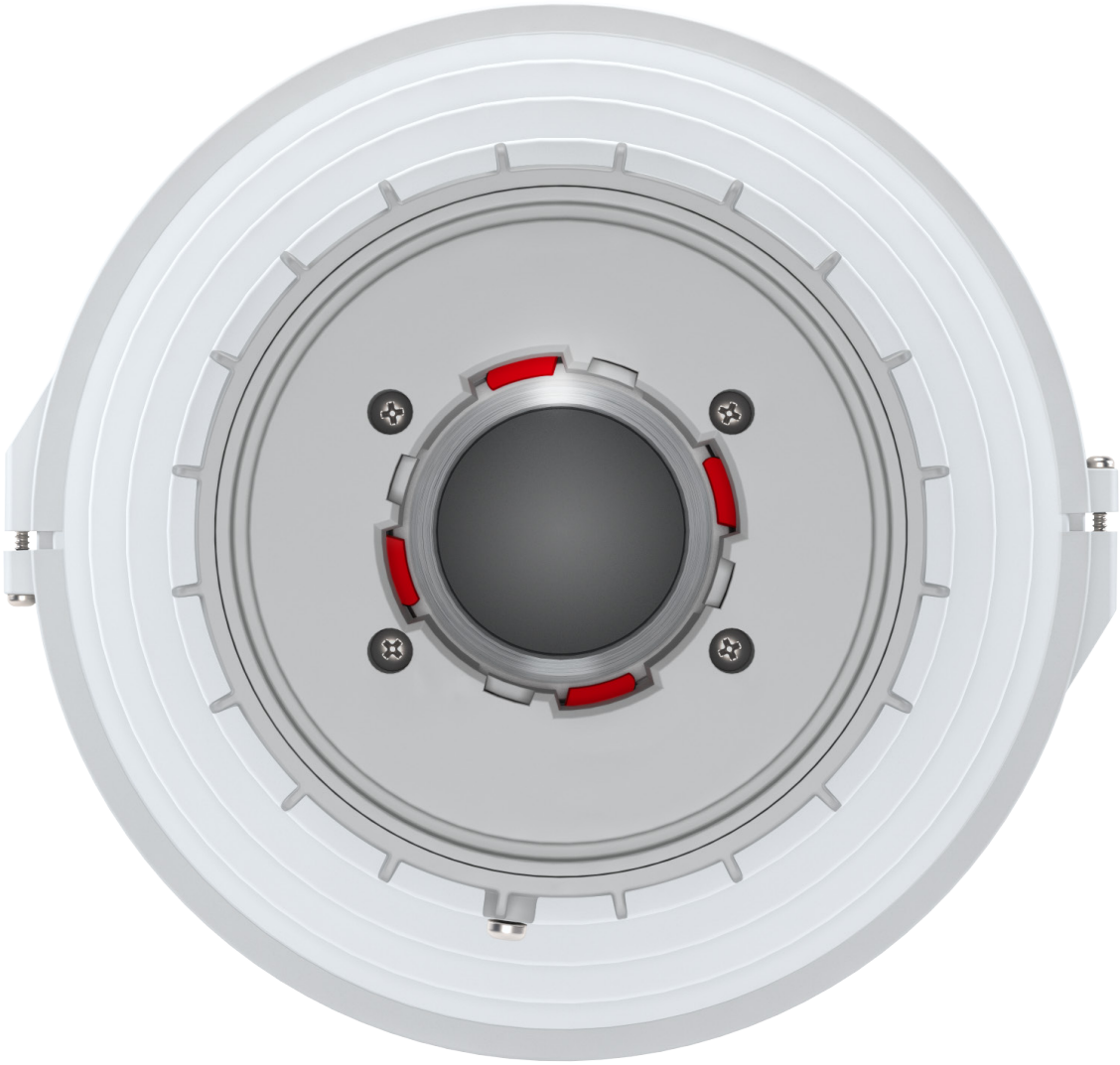


RF ELEMENTS®

Wireless Broadband & Antennas Catalog

Technology for fast, sustainable wireless.

Grow Smart. Reject Noise. Save Spectrum.

Wireless Renaissance

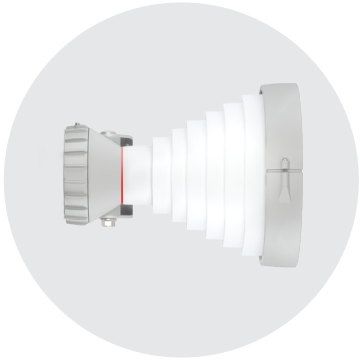
Broadband internet has evolved to be a necessary utility to live in today's modern world. Wireless is capable of delivering fiber speeds at a fraction of the time and cost of a fiber connection. We are upon a Wireless Renaissance and it's driven by the virtually endless demand for more and more bandwidth everywhere. It seems like the perfect match of demand and technology - but there is one major problem.

THE PROBLEM: RF POLLUTION

RF pollution is at an all-time high due to the enormous amount of RF noise created by today's poorly designed hardware. Noise is usually the result of RF signals that travel too far, in unwanted directions or with wrong signal timing. This massive amount of noise is a consequence of millions of radios deployed over the last decade with zero respect for sustainability.

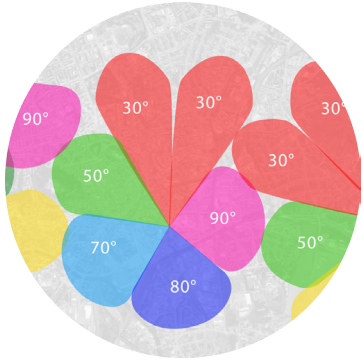
Vendors keep offering and WISPs keep deploying the wrong, out-dated gear, in an inappropriate way, creating wireless networks that hardly work as they should. Without a solution to massive RF pollution problem, the Wireless Renaissance will never happen in the expected scale.

WE DELIVER FAST, SUSTAINABLE WIRELESS!



NOISE REJECTION

ZERO LOSS



MASSIVE SCALABILITY

Noise Rejection

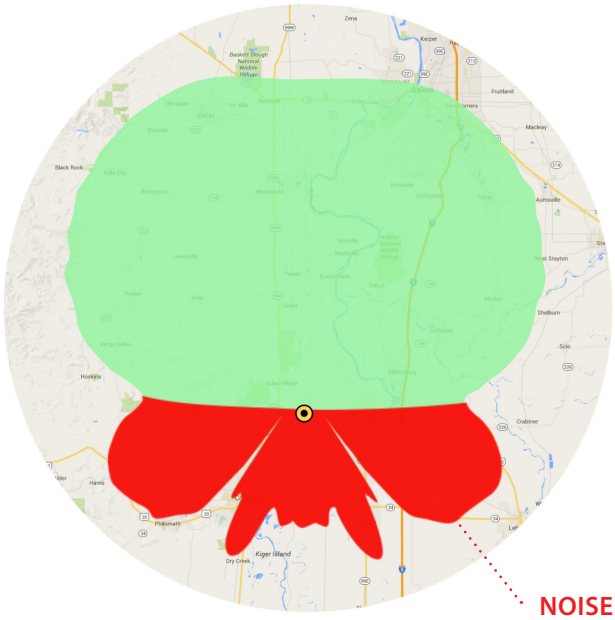
Our approach to the problem of RF pollution is logical and simple, yet truly unique. Instead of dealing with excessive amounts of noise by using complex and expensive methods, such as active filtering or gps synchronization, we focus on the fundamentals of correct signal propagation.

We try to remove the source of these problems, not add products that mask or filter its consequences, as our competitors try to do.

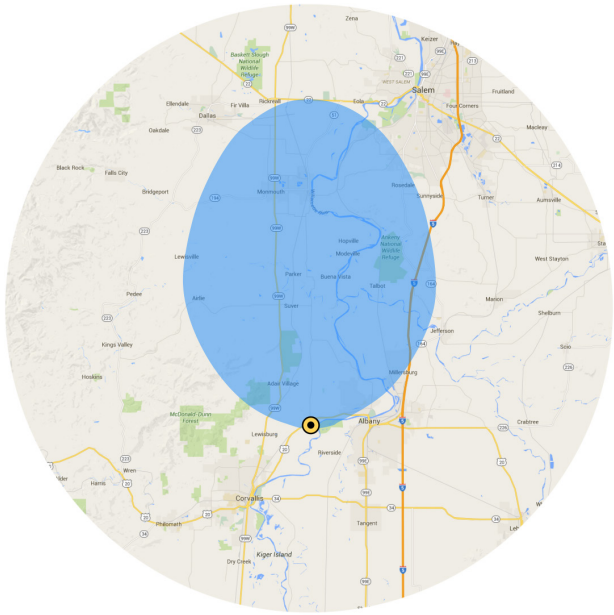
RF elements approach is rather about cleaning the air, not about a better filtering gas mask.

Our revolutionary antennas are based on Horn antenna technology, which we re-invented for today's complex challenges and has become the market leader in performance, cost, and spectrum efficiency. Our noise rejection features are unique and define a new class of wireless performance in a highly competitive market.

CURRENT INDUSTRY STANDARD



RF ELEMENTS TECHNOLOGY



Zero Loss

To achieve superior wireless performance, there are two key issues: Noise rejection and RF Loss. The main reason for RF signal loss is transmission of the RF signal between the radio and antenna. Typically signals travel via coaxial cables and connectors, where signal is simply lost due to the laws of physics. From the point of RF loss, coaxial cables and connectors are a necessary evil. They add nothing to the signal but problems and loss. We have solved this issue. Forever!

Our proprietary TwistPort™ waveguide connector has no cables and no coaxial components. It uses a waveguide to transport the RF signal between radio and antenna. In comparison to the current market standard, such as RP-SMA coaxial connectors, TwistPort™ is virtually lossless. It is also very durable and extremely easy to use. Connecting radios is brilliantly simple - "twist and lock" - all done with one hand!

COAXIAL PIGTAILS

RF LOSS

TWISTPORT™

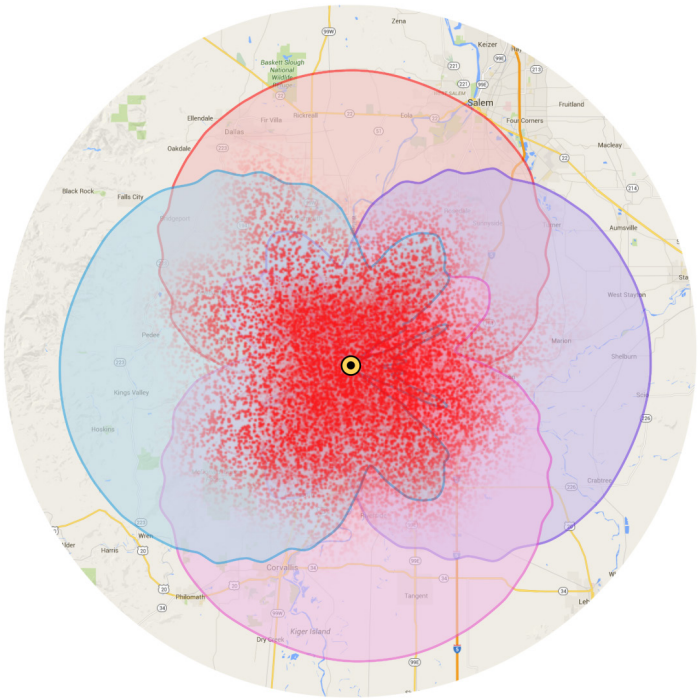
LOSSLESS

Massive Scalability

With current wireless equipment, increasing network granularity is simply not possible. Existing wireless equipment is hardly capable of delivering the performance needed TODAY, mainly due to low RF noise rejection and high loss. Also, ISPs often overlook the performance needed TOMORROW, rather worry about their current issues. This is now the past and the future is bright once again.

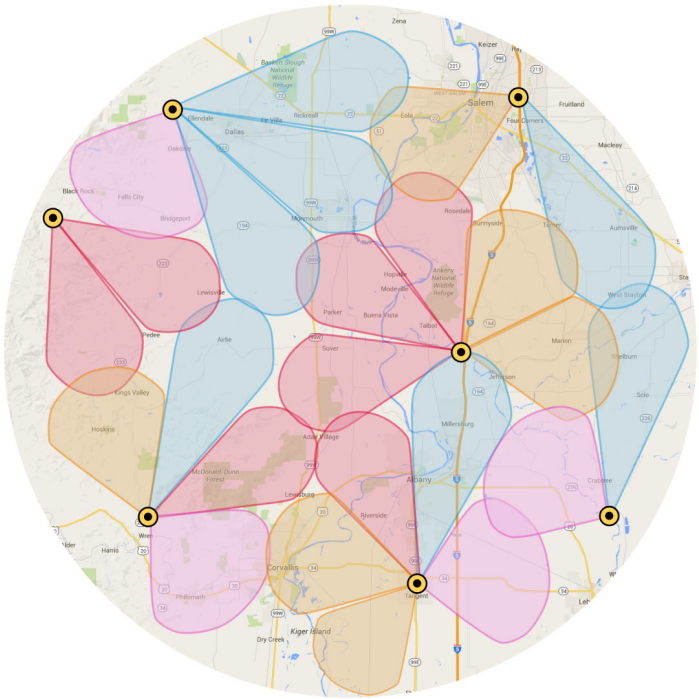
By solving the two biggest problems, RF Noise and RF Loss, we unlock a whole new dimension of wireless networking. WISPs now can supply their increasing customer demands for connectivity by deploying more sectors with higher density. They really can increase the granularity of their networks, and they can achieve it at no premium – something they have been dreaming about forever.

CURRENT INDUSTRY STANDARD



NO SCALABILTY
HIGH NOISE

RF ELEMENTS TECHNOLOGY



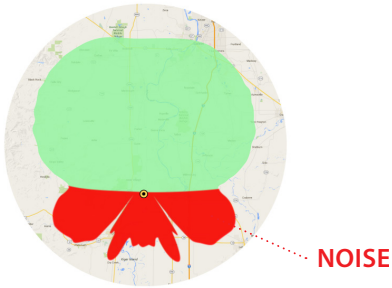
MASSIVE SCALABILITY

SYMMETRICAL HORN TP ANTENNAS

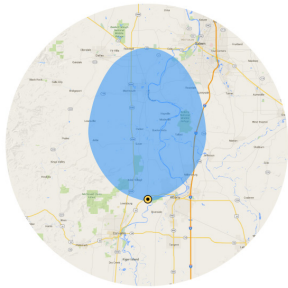
Symmetrical Horn TP Antennas are scalar horns with a symmetrical beam radiation pattern and industry changing TwistPort™ connector. They offer unique features: excellent noise rejection, lossless connection of radio and massive scalability option for higher sector density which make them perfect sector antennas. Symmetrical Horn TP Antennas are the key to sustainable, fast wireless.

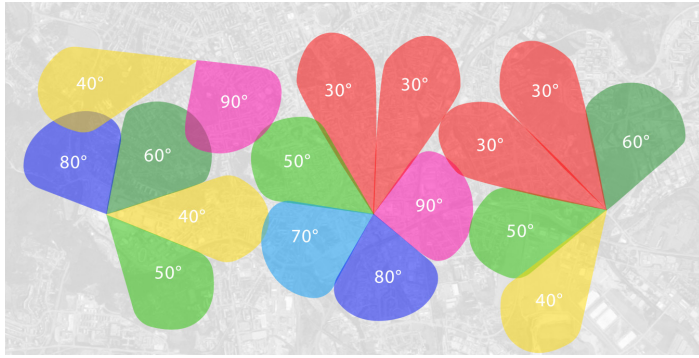
FEATURES

Competitive Sector Antenna



Horn TP Antenna



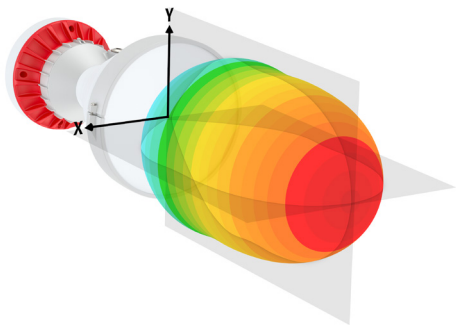


Excellent Noise Rejection

Symmetrical Horn TP Antennas have no side lobes, they focus energy into one main beam. The problem of noise is directly connected with antenna side lobes - an unavoidable feature in most competitive products. Symmetrical Horn TP Antennas behave differently, receiving no signal outside of their main beam.

Supreme Scalability

Symmetrical Horn TP Antennas offer breakthrough scalability options for wireless systems. Excellent noise rejection and great co-location characteristics allow for a higher density of sectors than a traditional sector technology. Symmetrical Horn TP Antennas come with precise radiation angles, from 30 to 90 degrees.



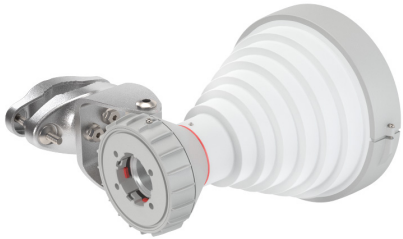
Symmetrical Beam Pattern

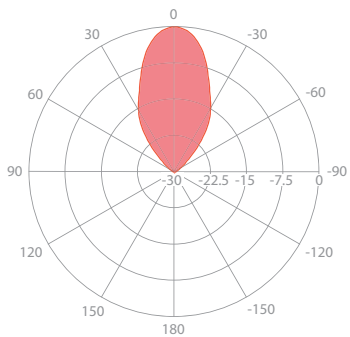
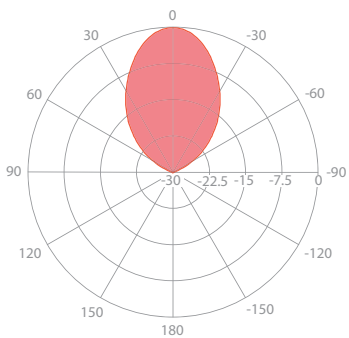
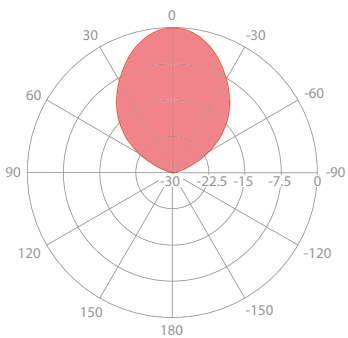
Symmetrical Horn TP Antennas have a unique beam shape and characteristics. The beam section is circular: azimuth and elevation radiation angles are identical so they can cover nearby areas much easier. The beam pattern does not vary with frequency and the antenna gain is balanced over a wide frequency range.

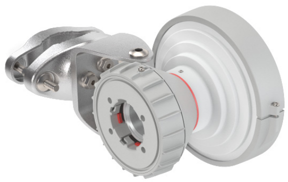
Zero Loss

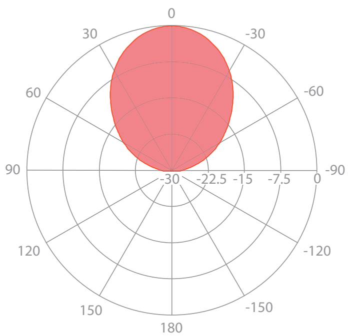
Symmetrical Horn TP Antennas feature our industry changing TwistPort™ connector, a patent pending quick-locking waveguide port. TwistPort™ is virtually lossless: there are no coaxial RF connectors or RF cables that cause significant signal loss. Connecting radios can done with one hand - "twist and lock".

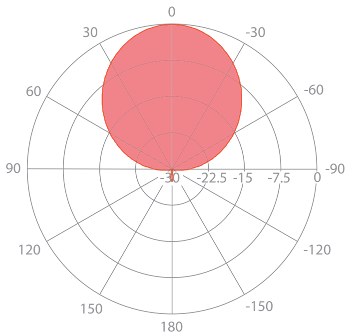
MODELS

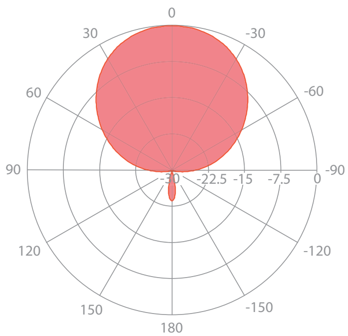


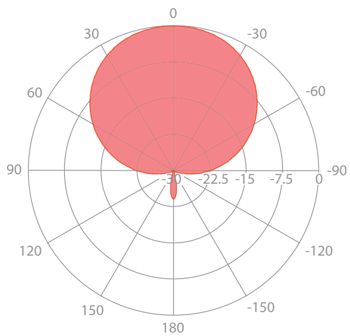
	30° Sector	40° Sector	50° Sector
Beam Pattern			
Gain	18.5 dBi	16.2 dBi	14.3 dBi
Front-to-back Ratio	37 dB	40 dB	53 dB
Product ID	SH-TP-5-30	SH-TP-5-40	SH-TP-5-50
MSRP	120.00 USD	115.00 USD	110.00 USD









60° Sector	**70° Sector**	**80° Sector**	**90° Sector**
13.2 dBi	11.5 dBi	10.4 dBi	10 dBi
36 dB	29 dB	29 dB	28 dB
SH-TP-5-60	SH-TP-5-70	SH-TP-5-80	SH-TP-5-90
110.00 USD	110.00 USD	99.00 USD	99.00 USD

ULTRAHORN™ TP ANTENNAS

Ultimate Noise Rejecting Point-to-Point Horn Antenna

UltraHorn™ TP antennas are high gain, highly directional scalar horn antennas for point-to-point connections. They offer all the benefits of scalar horns for point-to-point use: ultra noise rejection, lossless connection of radio and symmetrical beam with no side lobes. These unique radiation properties make them excellent antennas for long links in environments with a high level of noise.

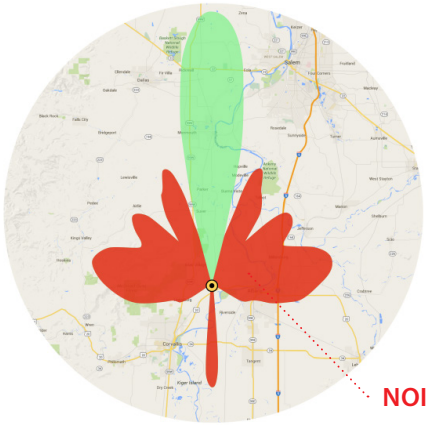
UltraHorn™ TP 5-21
Product ID: UH-TP-5-21

UltraHorn™ TP 5-24
Product ID: UH-TP-5-24

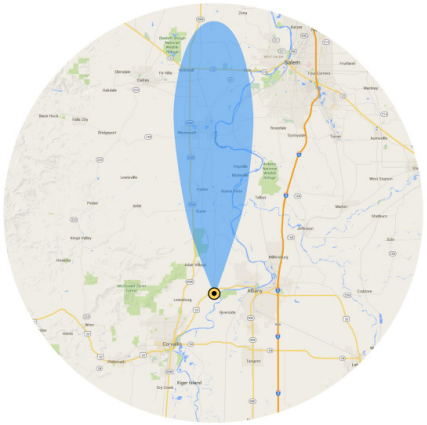
Ultimate Noise Rejection

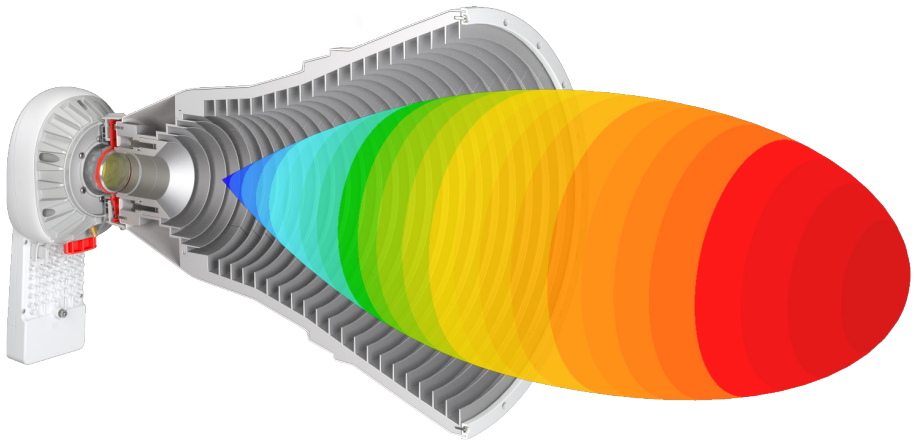
UltraHorn™ TP antennas do not have side lobes which allows them to reject noise. Side radiation is directly related to noise: radios transmit and also receive interference from unwanted directions. Side lobes from most mainstream point-to-point antennas are huge, sometimes almost half the size of the main lobe and thus having a huge impact on overall performance. UltraHorn™ TP antennas receive significantly less noise allowing them to achieve amazing performance in noisy environments.

Current PtP Antenna



UltraHorn™ TP





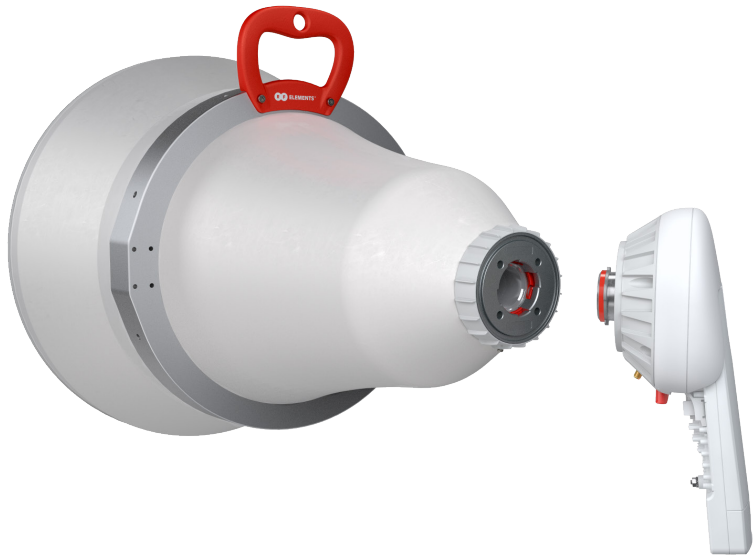
Unique beam without side lobes

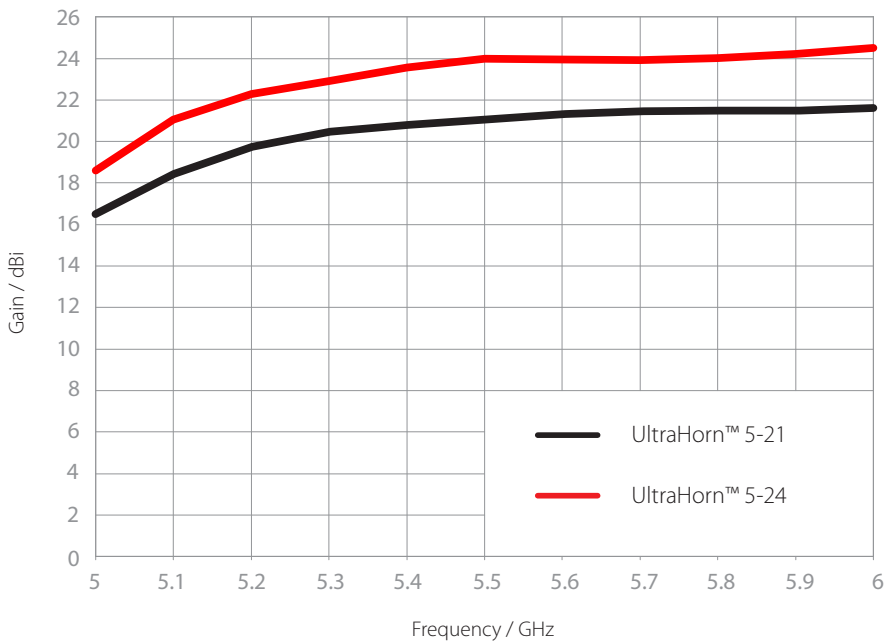
UltraHorn™ TP antennas are truly directional antennas: signal is focused only to a main beam without any side lobes. Precise radiation patterns of UltraHorn™ TP antennas allow you to create long links in high noise environment with unprecedented performance. The optimal beamwidth makes aiming very simple compared to other point-to-point antennas.

FEATURES

Zero Loss

UltraHorn™ TP Antennas feature our industry changing TwistPort™ connector, a patent pending quick-locking waveguide port. There are no coaxial RF connectors or RF cables anymore that makes TwistPort™ virtually lossless connector. Connection of radio is brilliantly simple - "twist and lock" - all done with one hand!



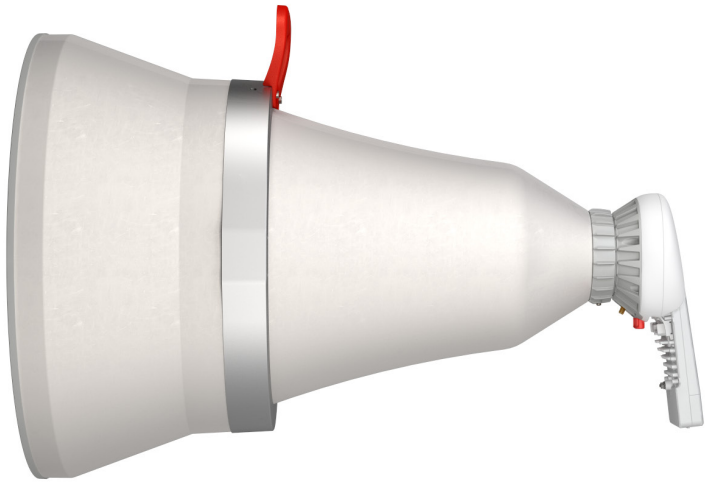


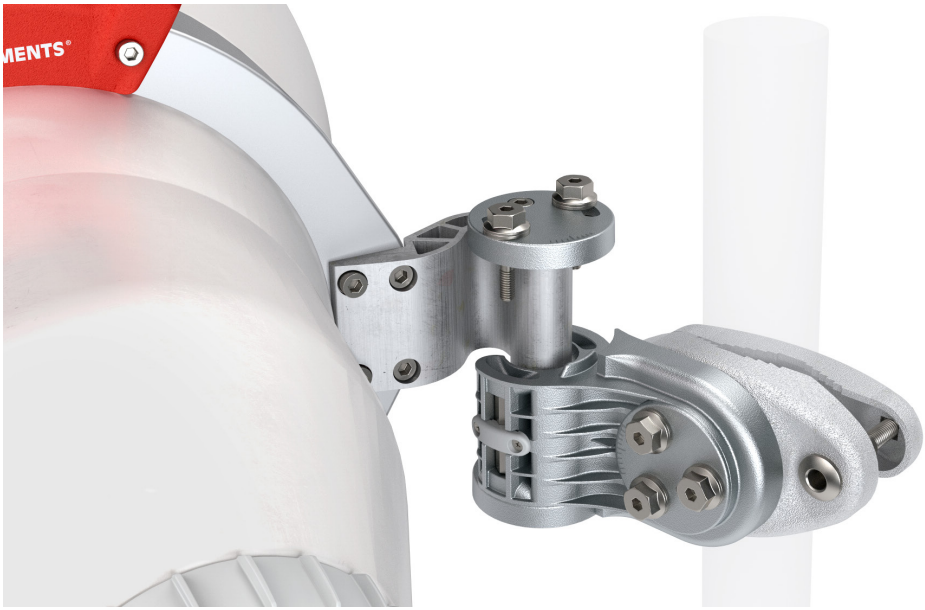
High Gain

UltraHorn™ TP antennas come with surprisingly high gain: 21 dBi gain for UH-TP 5-21 and 24 dBi for UH-TP 5-24. In combination with narrow beamwidths and no side lobes, UltraHorn™ TP antennas bring amazing performance even when compared to higher gain competitive products.

No Accessories Needed

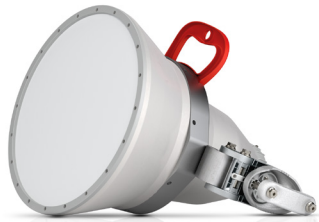
UltraHorn™ TP antennas come as a complete antenna solution for a point-to-point link. There is no need to spend more money for radomes or shrouds. No extra costs for additional shielding that burdens the tower and does not work properly. UltraHorn™ TP antennas have everything. Just buy an appropriate TwistPort™ Adaptor to connect your radio and deploy. That's it!

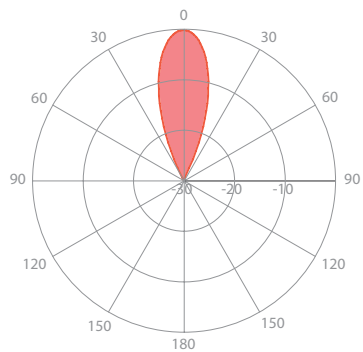
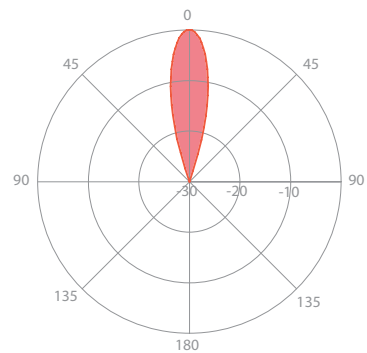




Innovative Mounting System

UltraHorn™ TP antennas feature our newest innovative mounting system that makes antenna installation an easy task. The mount is completely separated from the antenna so first install just the bracket on the pole and then simply slide the antenna on the bracket. Thanks to this mounting system, adjustment is quick and easy as well. The optimal beam shape makes aiming very simple compared to mainstream parabolic dish point-to-point antennas.



Beam Pattern		
Gain	21 dBi	24 dBi
Azimuth Beam Width -3 dB	H 16° / V 15°	H 11° / V 11°
Front-to-back Ratio	38 dB	40 dB
Product ID	UH-TP-5-21	UH-TP-5-24
MSRP	229.00 USD	299.00 USD

TWISTPORT™ ADAPTORS

TwistPort™ Adaptors make the most popular connectorized radios compatible with any TwistPort™ antennas. TwistPort™ Adaptors allow easy integration with Ubiquiti Networks™ Rocket™ radios, MikroTik™ RouterBoards™ and Cambium Networks™ ePMP1000 radios. Thanks to them you can utilize our technology for fast and sustainable wireless.

FEATURES

For UBNT™ Rocket™ Radios

The installation of radio is effortless: simply, slide the radio into the adaptor until you hear "click". To unlock, press the button and slide the radio out. For improved co-location performance TwistPort™ Adaptors come also in shielded version.

For MikroTik™ RouterBoards™

TwistPort™ adaptors require a regular 5 GHz radio on the RouterBoard™: an on-board or attached module with MMCX ports. The installation of RouterBoard™ is quick and easy. Come with integrated shielding.

For Cambium Networks™ ePMP™ 1000

TwistPort™ Adaptor uses special coaxial connectors without threads, so the installation is simply: slide the radio into the adaptor until you hear "click". To unlock, press the button and slide the radio out.

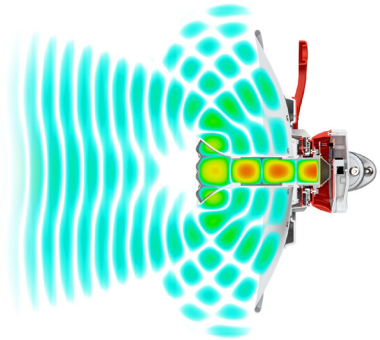
	TwistPort™ Adaptor for Rocket 5AC Prism	TwistPort™ Adaptor for airFiber® 5X	TwistPort™ Shielded Adaptor V2 for Rocket M5
Product ID	TP-ADAP-R5AC-PRISM	TP-ADAP-AF-5X	TP-ADAPTOR-RM5-S-V2
Compatible radio	Ubiquiti Networks™ Rocket™ 5AC Prism	Ubiquiti Networks™ airFiber® 5X	Ubiquiti Networks™ Rocket™ M5
MSRP	44.90 USD	44.90 USD	44.90 USD

TwistPort™ Adaptor V2 for Rocket 5AC - PTP/PTMP	**TwistPort™ Shielded Adaptor V2 for Rocket AC**	**TwistPort™ Adaptor V2 for ePMP 1000 AP or CSM**	**TwistPort™ Shielded Adaptor V2 for RouterBoard**
TP-ADAPTOR-R5AC-PTP-V2	TP-ADAPTOR-R5AC-S-V2	TP-ADAPTOR-EPMP-V2	TP-ADAPTOR-RB-S-V2
Ubiquiti Networks™ Rocket™ 5AC-PTP/PTMP	Ubiquiti Networks™ Rocket™ 5AC-Lite	Cambium Networks™ ePMP™ 1000	MikroTik™ RouterBoard™
29.90 USD	44.90 USD	29.90 USD	44.90 USD

ULTRADISH™ TP ANTENNAS

UltraDish™ TP Antennas are high-gain directional parabolic antennas with TwistPort™ lossless connector. Antennas are highly directional with depressed sidelobes for ultimate performance.

	UltraDish™ TP 400	**UltraDish™ TP 550**
Gain	24.5 dBi	27.5 dBi
Front-to-Back Ratio (Min)	35 dB	37 dB
Product ID	ULD-TP-400	ULD-TP-550
MSRP	99.00 USD	129.00 USD



Suppressed Side lobes

UltraDish™ TP antennas have suppressed side lobe radiation that reduces interference and enables installation in areas with high noise levels. The gain of UltraDish™ TP Antennas is achieved by focusing the signal delivered via the TwistPort™ waveguide.

Zero Loss

TwistPort™ connectors are virtually lossless: there are no coaxial RF connectors or RF cables that cause significant signal loss. In comparison to widely used coaxial cables and connectors, the loss on TwistPort™ is almost unmeasurable.

Easy Installation

UltraDish™ TP Antennas come with a handle for easy manipulation. Climbing a tower with the UltraDish is easy due to its compact size and carabiner hole. Installation of the antenna is very simple thanks to our innovative mount and the radio can be installed with one hand in a second just - "twist and lock".

Innovative Mounting System

UltraDish™ TP features a new innovative mounting system. The mount is separated from the antenna, and therefore the antenna installation is simple. First install just the bracket on the pole and then simply slide the UltraDish™ TP antenna on the bracket. Adjustment is easy and quick.

" The antenna is quite impressive. I never noticed how big the hole is below and close to the tower. Close customers have much better signal as compared to a regular sector with no downtilt, even on a tower that is only 140 ft. My furthest customer is 4 miles, with the closest one at several thousand feet."

Speedwavz, USA

"We have been able to go to our sites that had overloaded sectors with no room for an upgrade path due to noise levels or size of antennas needed, we deploy 2-3 horns and balance out the old sectors."

Matthew Harrison,
PRIMO Wireless, New Zealand

rfe lab

Share your feedback with us.
Join our community at
www.rfelab.com

"For starters, design of Symmetrical Horn antennas are absolutely perfect - easy mounting & durable gear. TP adaptor for Rocket is used in 100% noisy environment and worked perfectly!"

Burc Gandil,
wirelesssistem.net, Turkey

"The TwistPort performed significantly better than the UBNT AC sector. No lobes, great SNR and good vertical performance. CPEs that would not lock up on the AC sector worked with the TwistPort."

Chadwick Wachs, auwirelles.net, USA

"Symmetrical Horn Antennas provide huge benefits. Signal and throughput improvements are significant. We have achieved desirable throughput to provide better service to our customers."

Starnet, Albania

"I have also got two 60 deg horns with M5 rockets and one carrier class sector with 5AC Prism up and running. The results have been amazing so far. It has been a long time since I have been this excited about new kit! Thanks RF, I am a big fan of your equipment."

Egge Mulder, Eden Telecom, RSA

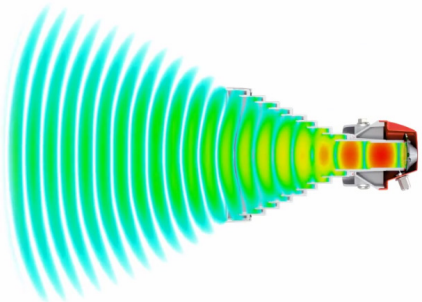
"We are using your 30 degree Horns with TwistPort Shielded adaptor for RouterBoard and they are working perfectly. After we replaced previous antennas with yours, CCQ went siginificantly up. And we are in very noisy environment where we see more than 80 other networks."

Jan Marek, OMEGA tech, CZ

SYMMETRICAL HORN CARRIER CLASS

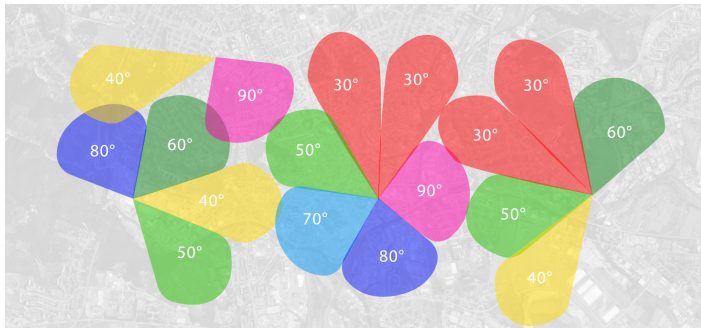
Symmetrical Horn Carrier Class are scalar horn antennas with a symmetrical beam radiation pattern without side lobes. They offer unique features: excellent noise rejection and supreme scalability option for higher sector density. These make them perfect sector antennas.

FEATURES



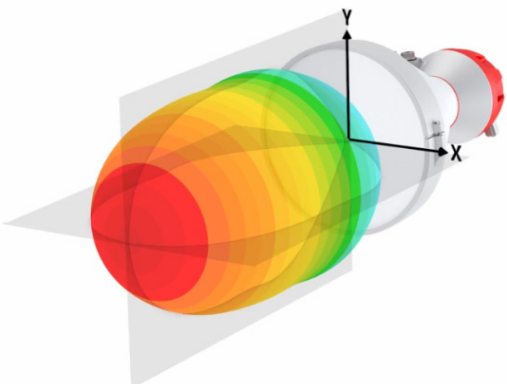
Excellent Noise Rejection

Symmetrical Horn Carrier Class Antennas have no side lobes - they only focus energy into one main signal beam. Thanks to unique radiation properties the radio will transmit and receive significantly less noise compared to mainstream sector antennas. This saves the most important resource in wireless - Spectrum.



Supreme Scalability

Symmetrical Horn Carrier Class Antennas offer breakthrough scalability options for wireless systems. Unique beam performance and great co-location characteristics allow for a higher density of sectors than a traditional sector technology.



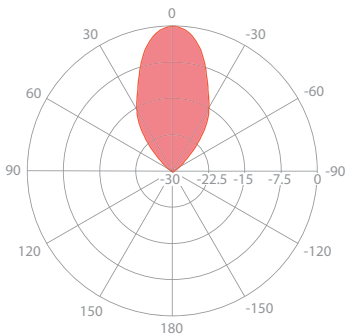
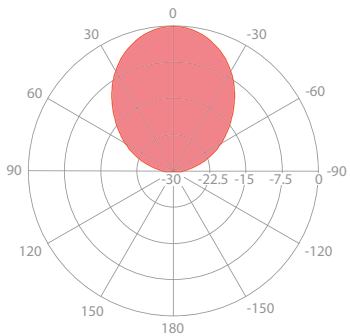
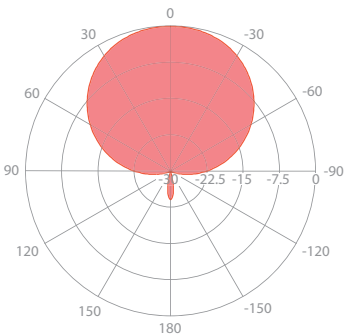
Symmetrical Beam Pattern

Symmetrical Horn Carrier Class Antennas have an unique beam shape and characteristics. The beam section is circular: azimuth and elevation radiation angles are identical. The beam pattern does not vary with frequency and the antenna gain is balanced over a wide frequency range.

N-type Connectors

Symmetrical Horn Carrier Class Antennas feature N-type female connectors, allowing connection with a wide range of radios, such as Mimosa™, Cambium Networks™ PMP450, LigoWave™, UBNT™ Rocket M5 Titanium, MikroTik™ connectorized radios (NetBox™, BaseBox™ and NetMetal™) and many others.

MODELS

	30° Sector	60° Sector	90° Sector
Beam Pattern			
Gain	18.5 dBi	13.2 dBi	10 dBi
Front-to-back Ratio	41 dB	36 dB	38 dB
Product ID	SH-CC-5-30	SH-CC-5-60	SH-CC-5-90
MSRP	220.00 USD	220.00 USD	220.00 USD


RF ELEMENTS

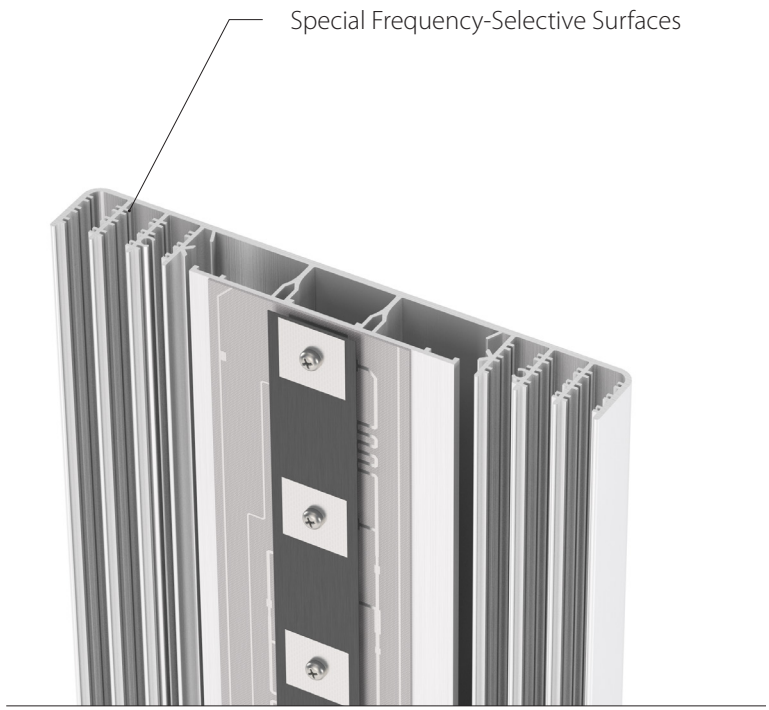
SECTOR CARRIER CLASS

Sector Carrier Class Antennas are optimized for the best MiMo performance and cluster deployment. Thanks to our patent pending BackShield™ technology, co-location is an easy task.

FEATURES

Designed for Cluster Deployment

Sector Carrier Class Antennas feature BackShield™, our patent-pending system designed to attenuate sidelobes and backside near-field radiation. The BackShield™ technology significantly improves the co-location ability in cluster sector deployments.



BackShield™ for Cluster Deployments

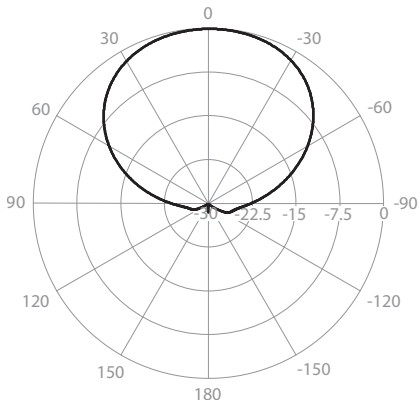
Frequency-selective reflectors that attenuate side lobes and backside radiation are integrated into the antenna structure. They are optimized for a particular frequency range where the antenna works.

FEATURES

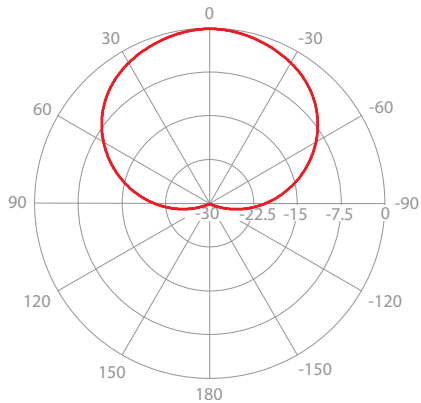
Balanced RF Performance

RF elements® Sector Carrier Class Antennas are optimized for balanced performance between horizontal and vertical antenna systems. The radiation patterns and gain in horizontal and vertical polarization are as similar as possible.

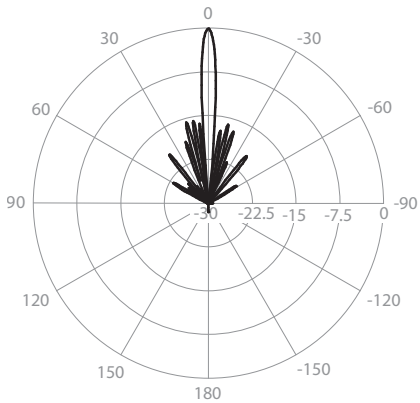
Azimuth Pattern **H**



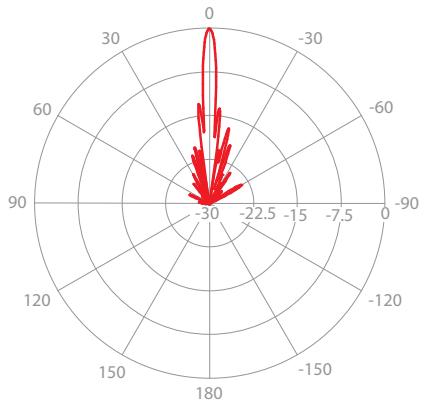
Azimuth Pattern **V**



Elevation Pattern **H**



Elevation Pattern **V**

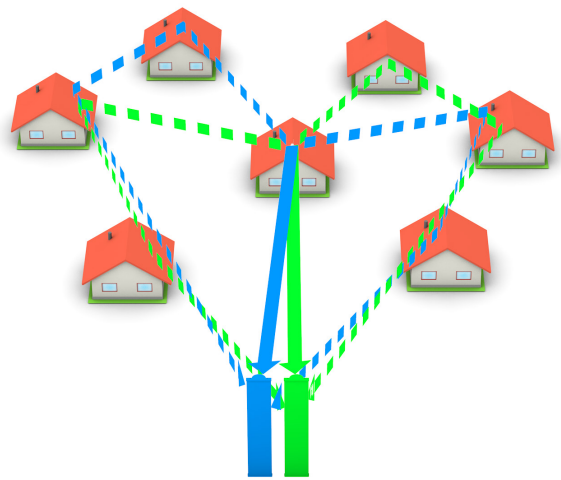


Balanced performance is a key requirement for perfect MiMo performance. Thanks to this unique balanced performance, Sector Carrier Class Antennas excel in MiMo deployments. The achievable area coverage and link performance are better than with mainstream antennas.

Why 3x3 Sector Antennas

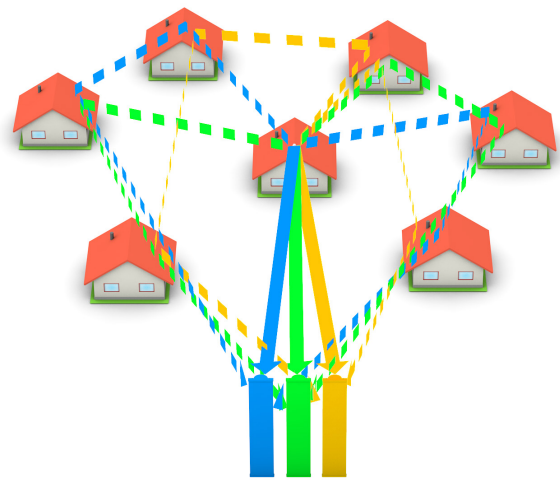
Sector Carrier Class Antennas are also available in 3x3 setup: Sector Carrier Class 5 GHz 16 dBi 3x3 (VVH) and Sector Carrier Class 5 GHz 16 dBi 3x3 (HHV). The antennas feature multiple horizontal or vertical systems that can be used with standard dual polarization H+V wireless CPEs.

2x2 Sector

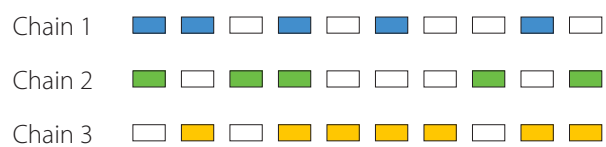


Packets Received

3x3 Sector



Packets Received



Noise

When used in an environment with increased noise, 3x3 Sector Carrier Class Antennas benefit from multiple antenna systems with the same polarization. For example, if there are V polarized signals causing noise, Sector Carrier Class 3x3 VVH will enhance the propagation of V signal thanks to the additional V polarized chain.

Reflections

Three chain antennas provide a higher diversity of signal. Each stream is transmitted independently and helps to better deal with reflections. If there are obstacles in the sector area, such as trees or buildings, a 3x3 Sector Carrier Class will perform better in reception of the signal than a 2x2 Sector.

MODELS

	2.4 GHz 14 dBi	5 GHz 16 dBi HHV	5 GHz 16 dBi VVH	5 GHz 17 dBi	5 GHz 20 dBi
Frequency Range (MHz)	2400 - 2485	5450 - 5850	5450 - 5850	5240 - 5850	5450 - 5850
Gain	13.8 dBi	H1 16.7 dBi H2 16 dBi V 16.7 dBi	V1 16.6 dBi V2 15.9 dBi H 16.6 dBi	17.5 dBi	19.7 dBi
Azimuth Beam Width -3 dB	H 75° V 69°	H1 77° H2 76° V 76°	V1 76° V2 76° H 77°	H 75° V 75°	H 74° V 74°
Azimuth Beam Width -6 dB	H 108° V 100°	H1 100° H2 99° V 102°	V1 102° V2 102° H 100°	H 100° V 100°	H 96° V 100°
Front-to-Back Ratio	24 dB	30.6 dB	30.6 dB	30 dB	29 dB
Product ID	SEC-CC-2-14	SEC-CC-5-16-HHV	SEC-CC-5-16-VVH	SEC-CC-5-17	SEC-CC-5-20
MSRP	130.00 USD	160.00 USD	160.00 USD	130.00 USD	140.00 USD

"Antennas provide very high advantages in regards of quality and stability of the connection, and behave much better in a frequency crowded environment."

Starnet, Albania

"Results looked spectacular. This is one of our best traditionally designed tower sites in our network in terms of signal and reach. We are most impressed."

Bluespan Wireless, USA

"With 17 dBi Carrier Class, I could get wider range and higher throughput than 20 dBi competitor with same MIMO access point."

Toner Center Network Computama, Indonesia

"Putting these on the ePMP radios brought our signals from around -65 to -55 and added 10 dB to the SNR. Speeds increased around 25 Mbps. This is just by putting these sectors on the AP."

Chadwick Wachs, auwirelles.net, USA

INTEGRATION PLATFORMS

RF elements integration platforms are designed for building custom solutions. This includes various CPE platforms, different enclosures and shielding that are suitable for any situation. Explore all of them on our website: www.rfelements.com.

BRACKETS

NanoBrackets® are our ultimate mounting solution that secures proper functionality of wireless systems and saves a significant amount of time at deployment. For more information, ckeck out our website: www.rfelements.com.

NOTES

Your distributor:

RF elements s.r.o.

Web: www.rfelements.com **Phone:** +421 2 3260 3711 **Email:** office@rfelements.com