



## Why the Aprisa XE provides a high performing alternative to high frequency microwave

The Aprisa XE, operating in spectrum bands below 3 GHz, is the perfect replacement for a network of high frequency 7 to 38 GHz microwave links. A single Aprisa XE link can provide long distance connectivity, bypassing existing infrastructure and greatly reducing capex. Here are 4RF's ten most frequently asked questions about how the Aprisa XE compares to higher frequency microwave links, together with a real-world deployment scenario:

### 1. Is there enough spectrum available in the lower bands?

Spectrum availability and congestion levels in all bands vary from country to country. The Aprisa XE supports more than ten spectrum bands below 3 GHz and 4RF customers have acquired licences in appropriate bands in over 130 countries around the world. 4RF's experience is that licences in the sub-3 GHz bands are easier to acquire in rural areas and in those countries where the higher bands are congested.

### 2. But doesn't everyone use higher frequencies?

Higher frequency bands are commonly deployed in urban areas where the distance requirements are low, and are often used at the core of networks. This means that perhaps there is more familiarity with the higher bands. However, the lower frequency bands excel where coverage of greater distances is required, often into rural areas.

### 3. How does the Aprisa XE's operational expenditure compare?

Spectrum licensing costs vary between countries, impacting opex. The Aprisa XE's overall opex compares favourably to that of higher band equipment. Fewer Aprisa XE links can cover a geographical area, given the greater distance a single link can cover, so overall network complexity is reduced, further reducing network planning and management overhead, and hence opex. Fewer sites also means reduced maintenance, power, and security requirements. Aprisa XE management is easy, with its in-built Element Manager software and the ability to manage a network of links with any SNMP-compliant network management package.

### 4. How do the maintenance requirements compare?

The Aprisa XE's lightweight antenna and single box solution, combined with its excellent reliability, compare very favourably to the maintenance costs of higher frequency systems with their split mounted systems as opposed to the Aprisa XE's all indoor units. Additionally, the reduced equipment needed across a whole network further simplifies management.

### The Aprisa XE in brief

- Highly flexible point-to-point microwave link
- Accommodates all data, voice and IP traffic requirements on a single future-proof platform
- Industry-leading platform: goes the greatest distance, delivering the greatest capacity
- Low total cost of ownership: technically and financially outperforms higher frequency microwave links, particularly in rural and remote areas

5. How do the equipment and infrastructure requirements compare?



Higher frequency microwave systems typically need solid parabolic antennas, with large expensive support structures. The Aprisa XE needs only lightweight antennas and minimal support. The smaller antenna size and ease of deployment mean that site location options are maximised and the fact that the Aprisa XE links much greater distances than higher frequency systems means that across a complete network, infrastructure requirements are significantly reduced.

6. How does the Aprisa XE's cost compare to higher frequency microwave?

The Aprisa XE focuses on delivering a high technology, highly integrated solution with excellent price-performance. Bypassing existing infrastructure, due to the Aprisa XE's long reach, means reduced site acquisition and equipment installation, less power consumption, and reduced security issues, for a low total cost of ownership.

7. How does the Aprisa XE's speed of deployment compare?

The Aprisa XE can be deployed quickly, with many deployments being completed in less than a day. Additionally, the smaller quantity of equipment that is needed, due to the Aprisa XE's greater distance, means that a complete Aprisa XE network can be deployed in less time than a higher frequency network.

8. How do the affects of the environment vary?

The Aprisa XE, with its use of lower frequency bands, is much less affected by free space loss, precipitation and atmospheric fades, when compared to higher frequency systems, where environmental conditions have a much greater impact on the availability and performance of the link.

9. How does the throughput of the Aprisa XE compare to higher frequencies?

Higher frequency systems can often achieve higher throughput owing to the larger channel sizes available. However, the Aprisa XE still provides up to 65 Mbit/s capacity, which is sufficient for many applications. Add to this the greater distances it can achieve, its carrier-class availability and its reduced infrastructure and maintenance requirements, and the overall price-performance the Aprisa XE achieves is very attractive indeed.

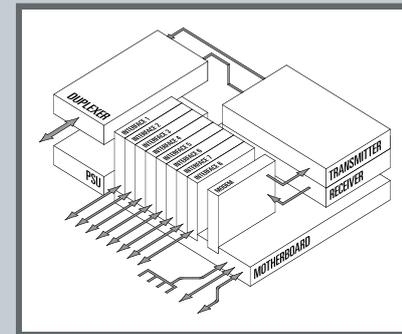
10. And what about the achievable distances?

The Aprisa XE can achieve much greater distances than higher frequency microwave systems, up to 250 kilometres with a single link. It therefore provides a highly cost-effective option for bypassing existing infrastructure, particularly for rural and remote areas, such as connecting mobile base stations directly to the core network without propagating capacity requirements back through the network.



**Aprisa XE**

More about the Aprisa XE



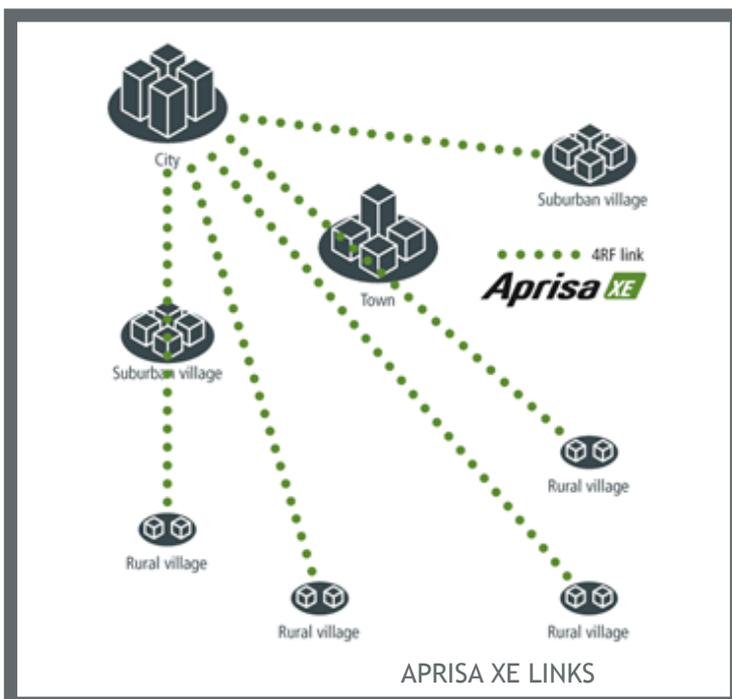
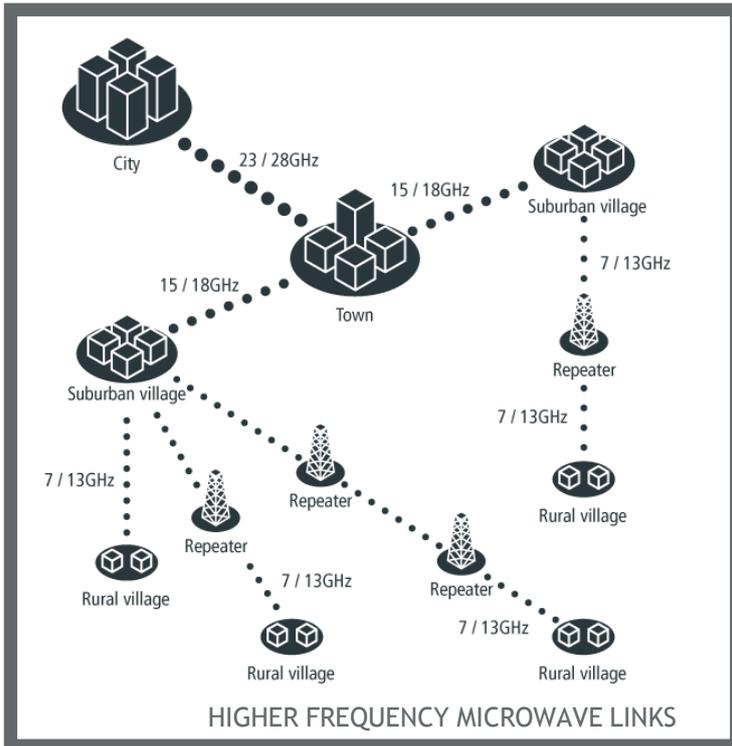
- Frequency bands from 300 MHz to 2.7 GHz
- Channel sizes from 25 kHz to 14 MHz
- Capacity from 72 kbit/s to 65 Mbit/s
- Flexible interface options: E1 / T1, 2 and 4 wire analogue, multiple data options, 10 / 100Base-T Ethernet

### Deployment scenario

Before the Aprisa XE was deployed, the backhaul capacity consumed in rural locations propagated back through the network, accelerating backhaul congestion and reducing the economic viability of remote base stations. The Aprisa XE network bypassed the existing microwave infrastructure, providing long distance links with minimal capital expenditure and reserving higher frequency bands for use in bigger urban markets.



**Aprisa XE**



### In conclusion

Higher frequency microwave links, typically between 7 and 38 GHz, clearly have a valuable role in core networks in densely populated urban environments, for high capacity traffic requirements over short distances.

However, the Aprisa XE is widely applicable throughout the network, with its long distance links, ease of deployment and maintenance, and high level of cost-effectiveness, providing all types of industries with a highly compelling business case and rapid return on investment, particularly where connectivity is needed for rural and remote locations.



**Aprisa XE**

THE ISSUE	HIGH FREQUENCIES	APRISA XE
Spectrum availability	Country variations	No less than higher bands
Use of bands	Often in urban areas	Throughout network
Opex	Varies	Favourably compares
Maintenance	Can be complex	Easy to maintain
Infrastructure	Solid antennas	Lightweight infrastructure
Capital expenditure	Varies	Low total cost of ownership
Speed of deployment	Varies	Less equipment needed
Environmental impact	High impact	Low impact
Throughput	High, larger channels	Usually sufficient
Achievable distance	Low to medium	High, up to 250 km



### ABOUT 4RF

Operating in more than 130 countries, 4RF provides radio communications equipment for critical infrastructure applications. Customers include utilities, oil and gas companies, transport companies, telecommunications operators, international aid organisations, public safety, military and security organisations. 4RF point-to-point and point-to-multipoint products are optimized for performance in harsh climates and difficult terrain, supporting IP, legacy analogue, serial data and PDH applications.

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