

10+ Gbps Dual Band Solution

THE COMBINED MICROWAVE AND mm-WAVE LINK
ON A SINGLE ANTENNA



10+ Gbps
capacity



Built for 5G

Operators of 5G networks are constantly being challenged by:

- ✓ Growing backhaul capacity demands
- ✓ Extreme deployment costs e.g., building long fiber optics lines
- ✓ Channel space limitation in conventional microwave spectrum

Many of these challenges can be solved using the ultra-wide mm-Wave E-band spectrum:

- ✓ Large 2 GHz channels are available in 80 GHz band
- ✓ The affordable licensed 80 GHz spectrum, provides more capacity at a lower cost per Mbps

Dual band solution leverages the advantages of both, MW and mm-Wave links

- ✓ E-band ensures maximum capacity and distance in good weather conditions
- ✓ Microwave bands ensure a fallback link in bad weather
- ✓ Because the 80 GHz transmission is greatly affected by rain-fade and free space-loss resulting in lower link availabilities look to dual band for solutions

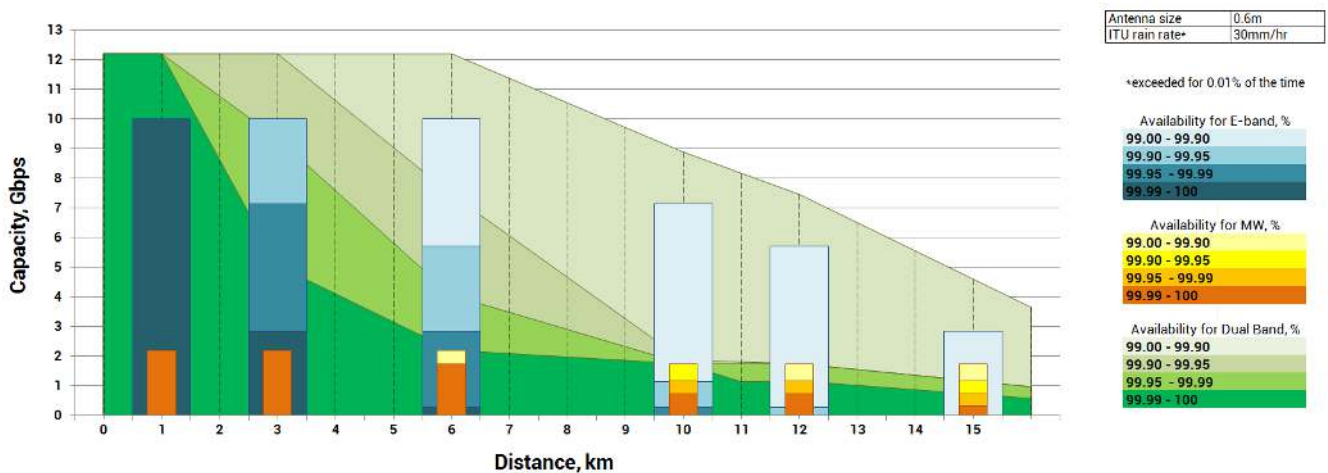


Chart 1. The substantial improvement of link performance using the dual band solution.

Chart 1 illustrates the systemic advantages of the dual band solution in terms of signal propagation. The four green areas on the chart show the resulting capacities of dual band solutions at various availability levels, depending on the link's distance.

The data shows that capacities and availabilities of dual band solutions perform better than those of individual link distances up to 15 km (about 10 miles).

The calculations in Chart 1 were performed by the Link Planning team at SAF Tehnika. Path analysis is the first step in maximizing dual band links – [contact us](#) for free link planning. Upon request SAF Tehnika link planning team can provide a detailed performance report for a specific case.

The dual band solution from SAF Tehnika consists of:

- ✓ Integra-E: e-band radio with maximum 1+0 capacity of 10 Gbps and 20 Gbps in 2+0 mode
- ✓ Integra-W, -G or -X: conventional SAF microwave radios, up to the 2.2 Gbps capacities
- ✓ CommScope dual band antenna 23/80 GHz, 18/80 GHz
- ✓ A 3rd party Ethernet switch for traffic aggregation (optional)

Advantages for single dual band antennas:

- ✓ Less tower space needed
- ✓ Reduced weight and wind load
- ✓ Saving on shipping and installation costs, and on tower rent results in lower total cost of ownership
- ✓ Faster antenna installation and alignment

Solution with separate MW and E-band antennas can also be used in specific cases, for instance for an upgrade of an existing link, either microwave or mm-Wave.

Dis-aggregated solution – each radio in separate casing - offers a maximum flexibility in terms of operating modes and frequency bands, as well as additional redundancy and reliability.



Figure 1. An illustrative example of the dual band solution from SAF Tehnika

Here are two possible dual band link configurations using Integra radios

1) With Integra-E and Integra-X links in Aggregation mode if supported by 3rd party high-capacity external Ethernet switch (preferred configuration) maximum capacity can be pushed to 12.2 Gbps – Figure 2.

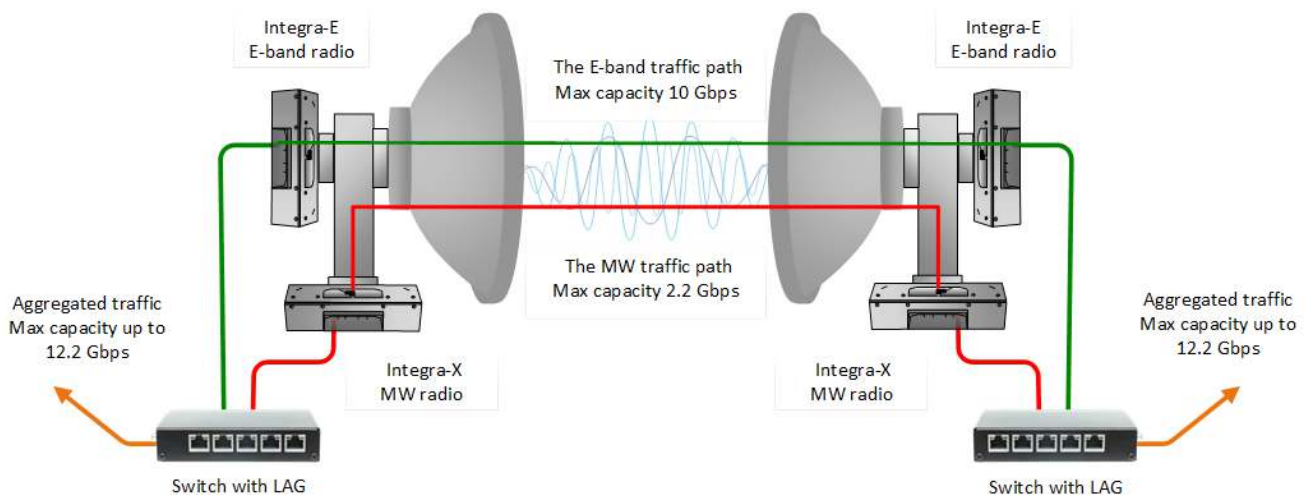


Figure 2. The dual band solution in Aggregation mode

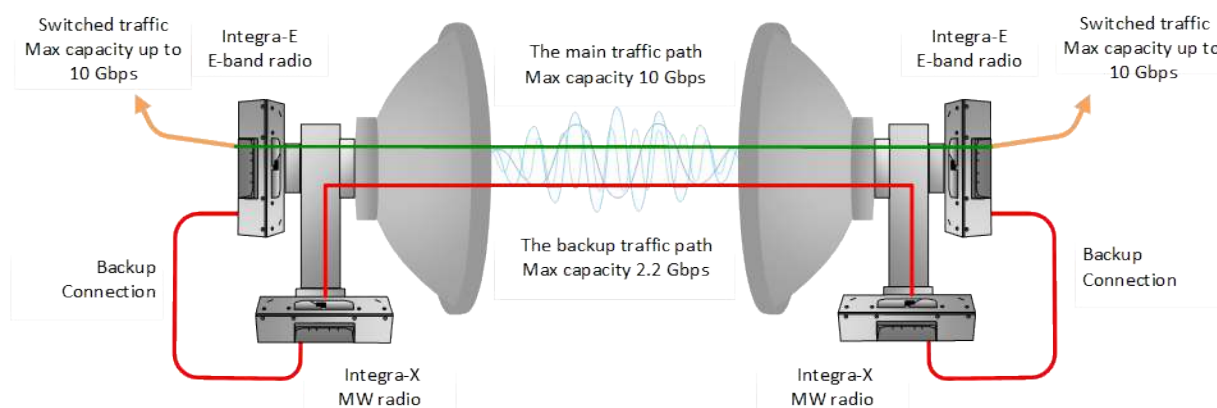


Figure 3. The dual band solution in Protection (Backup) mode.

2) Configuring Integra-E as the main link and utilizing built-in LSP/Backup functionality provides MW backup redundancy. When the Integra-E link capacity decreases below the pre-configured threshold, or sync loss has occurred, LSP/Backup will switch traffic to the Integra-X link. Maximum capacity will be limited to 10 Gbps in LSP/Backup mode and traffic will pass through one link at any timepoint. The external switch is not required in this configuration.

Full functionality of Integra radios: ACM, ACMB, Quality-of-Service and others can be used for traffic prioritizing and improvement of overall link availability. Please refer to User's manuals of both products for more information.