

The growing trend on the market these days is the rise of all outdoor microwave radio systems as they offer many advantages comparing to split mount IDU + ODU radio systems. Following our customer requirements SAF Tehnika offers a range of full outdoor design equipment. Find out why choose Full Outdoor (FODU) solutions.

Full Outdoor (FODU) General Advantages

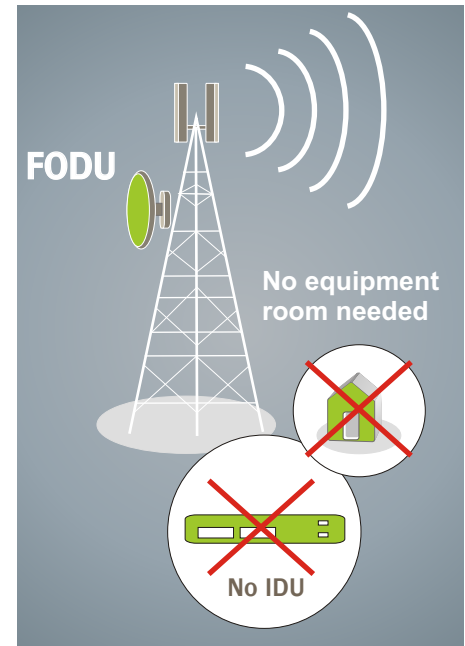
- The possibility of capacity upgrade for CFIP-108 and CFIP Lumina FODU starting from 10Mbps, 25Mbps, 50Mbps etc. up to 366Mbps.
- On average a FODU terminal consumes as minimum 20% less energy than IDU+ODU terminals of similar configuration.
- No need for special equipment room or rack - less cost for building the site and OPEX.
- Easy and convenient use for rooftop/tower repeaters to extend the reach of radio, overcome line-of-sight issues of rugged terrain, etc.
- As there is just one FODU unit, no IDU, it is simpler and cheaper to keep spare part stock, to troubleshoot, to configure and replace the unit.

CFIP-108 (Fast Ethernet) FODU Advantages

- CFIP FODU is an excellent choice to backhaul traffic from All Outdoor Base stations, GSM and CDMA currently, to be expanded or upgraded into LTE in the future, any setup demanding up to 4 E1/T1 and Ethernet interfaces.
- Use CFIP to future-proof the backhaul network by preserving E1/T1 connectivity and adding Ethernet for future use before migration to packet/IP backhaul traffic.
- CFIP FODU is an excellent choice to backhaul traffic from All Outdoor Base stations, WiMAX, WiFi or any other P2MP wireless broadband technology.
- In case Ethernet is the only interface needed, it is less cost and more convenient to use UTP cable from FODU directly into Ethernet switch instead of coaxial cable from ODU to IDU and another cable from CPE to IDU data interface.
- Low power consumption - up to 25W per terminal allows the use of alternative power sources like solar and wind.

CFIP Lumina (Optical GE) FODU Advantages

- Optical Ethernet connections of CFIP Lumina optical version provide excellent protection against lightning strikes and allow long distances between user equipment and CFIP Lumina FODU systems.
- Two Gigabit Ethernet ports of CFIP Lumina FODU provide simple (management and user traffic on separate ports) and advanced configuration (various network protection schemes and topologies).
- Separate cables into the radio (DC & FO Eth.) allow for flexibility to run these cables from separate locations if needed.
- Fiber optical Ethernet provides 100% guarantee there will never be interference in Ethernet cable from high power sources of EM fields close to cable.





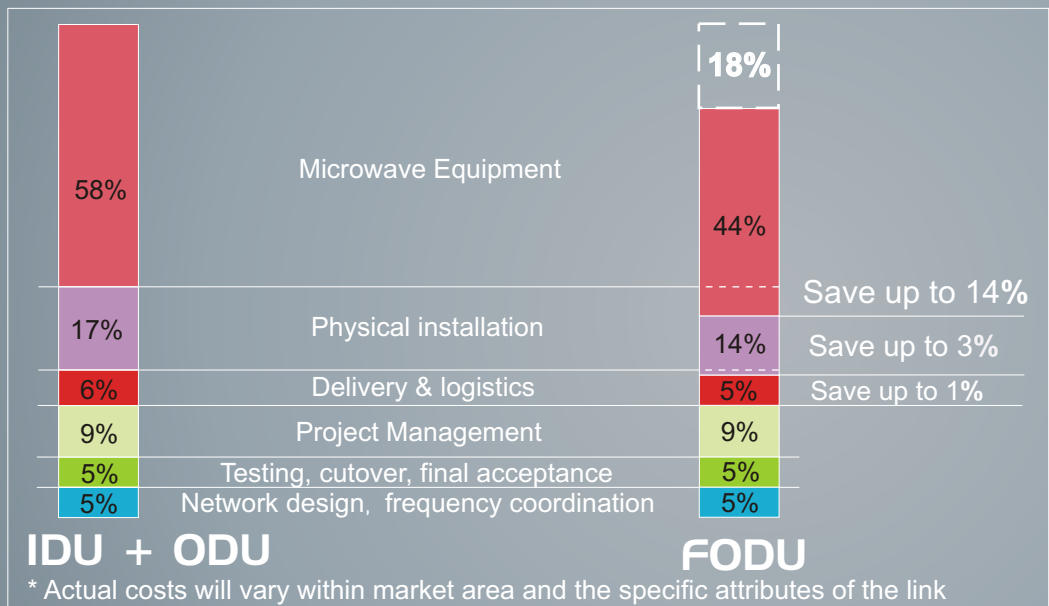
Financial benefits of FODU - CAPEX

In this part of the study we will outline FODU financial benefits of reduced capital expenditure. CFIP-108 and CFIP Lumina FODU features capacity upgrade possibility starting from 10Mbps and up to 366Mbps. The customer also saves on delivery expense as 1 Split Mount link takes up as much place as 2 FODU links (the most of the delivery cost is formed by antennas). As FODU is a simple plug & play system it is also more cost effective in the means of installation. But the most cost saving is on the microwave equipment - up to 12% of CAPEX can be saved as you need less equipment for building the network.

Typical Fixed-Wireless CAPEX Costs:

- 1) Micro and Macro System Design;
- 2) Site identification and acquisition - lease tower and roof top locations;
- 3) Spectrum Licence - one-time charge for frequency coordination;
- 4) Microwave Equipment - this includes radio electronics, antennas, cables and connectors, installation materials and power supplies;
- 5) Integration Services:
 - Individual link design including bill of materials
 - Configuring electronics, pre-deployment systems test and certification
 - Delivery logistics
 - Physical Installation
 - Testing
 - Cutover - switching from the old to the new equipment

Split Mount vs. FODU CAPEX comparison (per link)



Summary of Benefits:

- Less equipment needed - save on microwave equipment;
- Plug & play installation - save on physical installation;
- 2 FODU links = 1 IDU+ODU link in terms of delivery - save on logistics.

Save up to 18% on CAPEX when using FODU

Financial benefits of FODU - OPEX

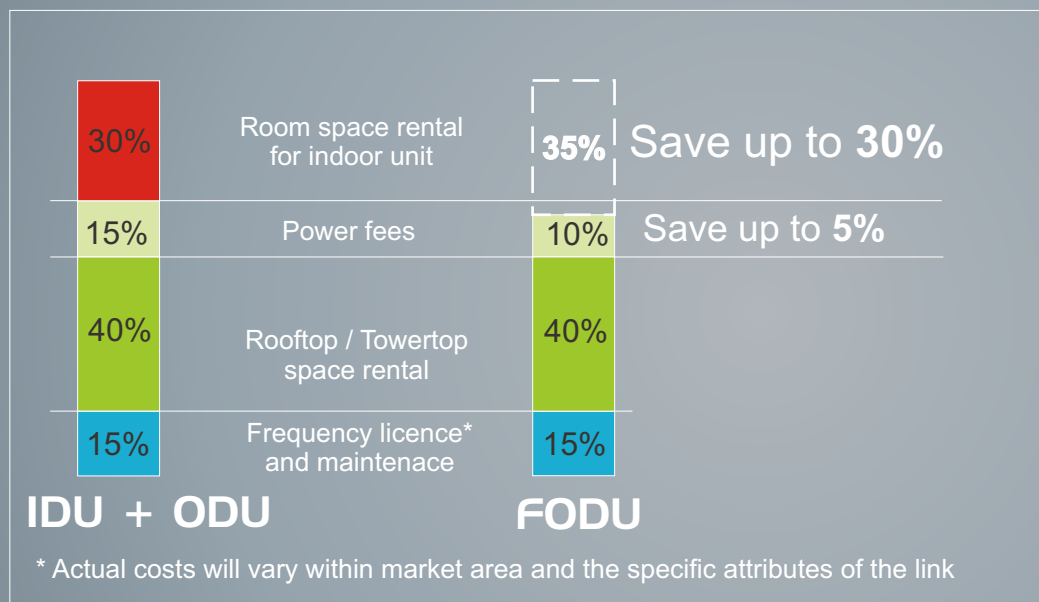
In the final part of the study we will outline significant long term benefits of reduced operational expenditure when using FODU. Some of the expenditure could be eliminated at all in case the FODU systems are used. For instance, there's no need to build or rent a space to stack indoor equipment for FODU systems which brings to significant long-term financial benefits comparing to IDU + ODU systems. You can save even more on monthly power fees as FODU has low power consumption comparing to Split Mount systems and FODU can also be used with alternative power sources.

We came to a conclusion that by utilizing FODU systems up to 35% of OPEX might be saved. Although, in different parts of the world operational and capital expenditures may vary - the trend remains, and FODU systems are less expensive in terms of maintenance and operational expenditures comparing to similar configuration Split Mount systems.

Typical Fixed-Wireless OPEX Costs:

- 1) Yearly Frequency licence lease;
- 2) Maintenance and Management monthly costs;
- 3) Monthly Power fees;
- 4) Tower Lease Costs - this is typically a monthly lease cost for each point-to-point antenna on a tower or rooftop. The cost increases with larger antennas.

Split Mount vs. FODU OPEX comparison (per link)



Summary of Benefits:

- Use of FODU eliminates monthly equipment room rent;
- Less power consumption - save on power fees;
- Faster return on investment.

Save up to 35% on OPEX when using FODU