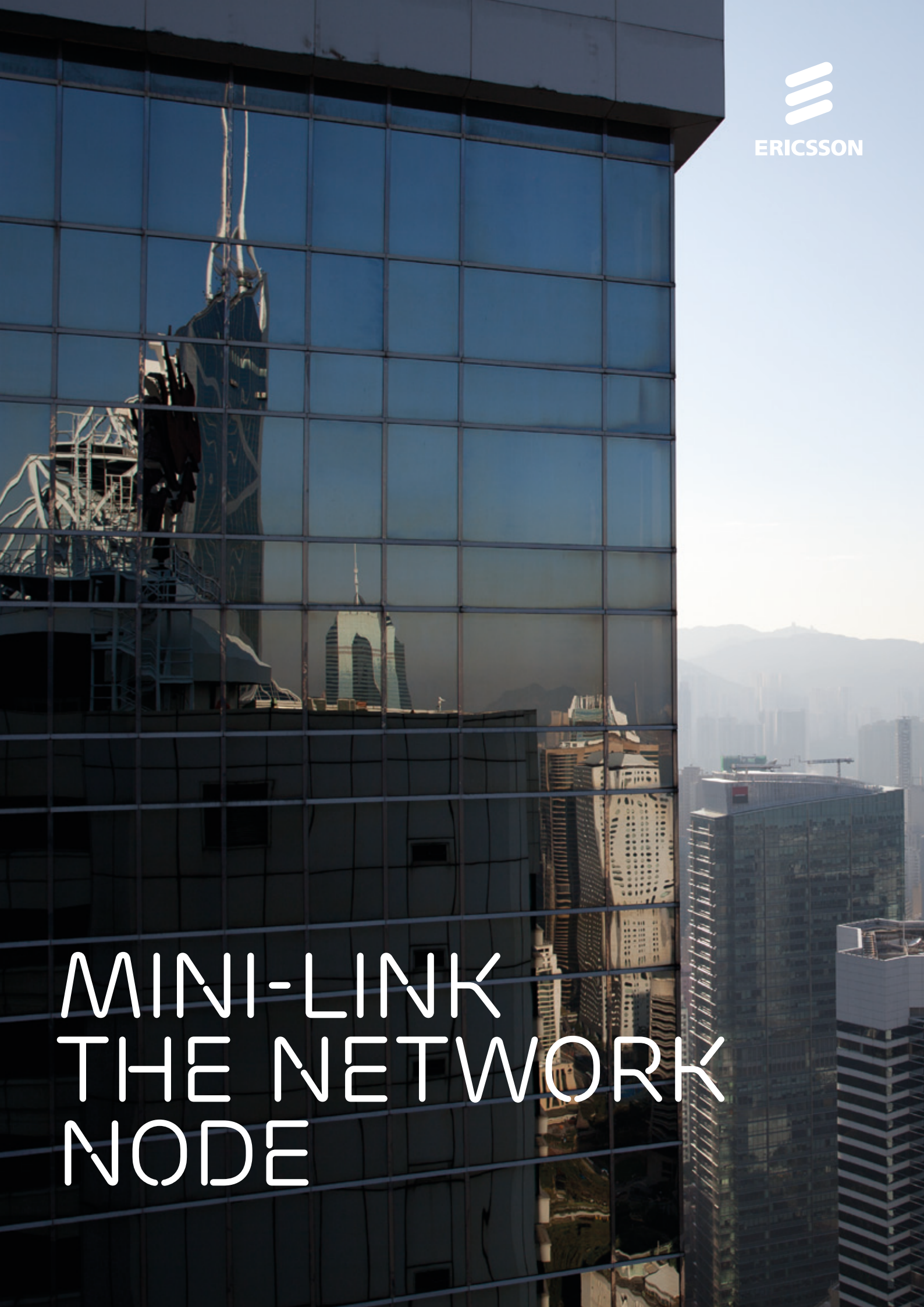


ERICSSON

MINI-LINK THE NETWORK NODE

MINI-LINK, THE NETWORK NODE ON THE ROAD TO 5G

Data traffic is growing at a steady pace and there is a definite need to increase data capacity in RAN and backhaul. The timing of this increase will vary from market to market, as well as from site to site. Some markets have yet to deploy HSPA, while others have already deployed LTE on a large scale. In addition, 5G mobile communication will become available around 2020, evolving from LTE. This means that a microwave network node for the future requires high node capacity, compact and modular building practice, advanced packet functionality and features that are aligned and backward-compatible across different network nodes.

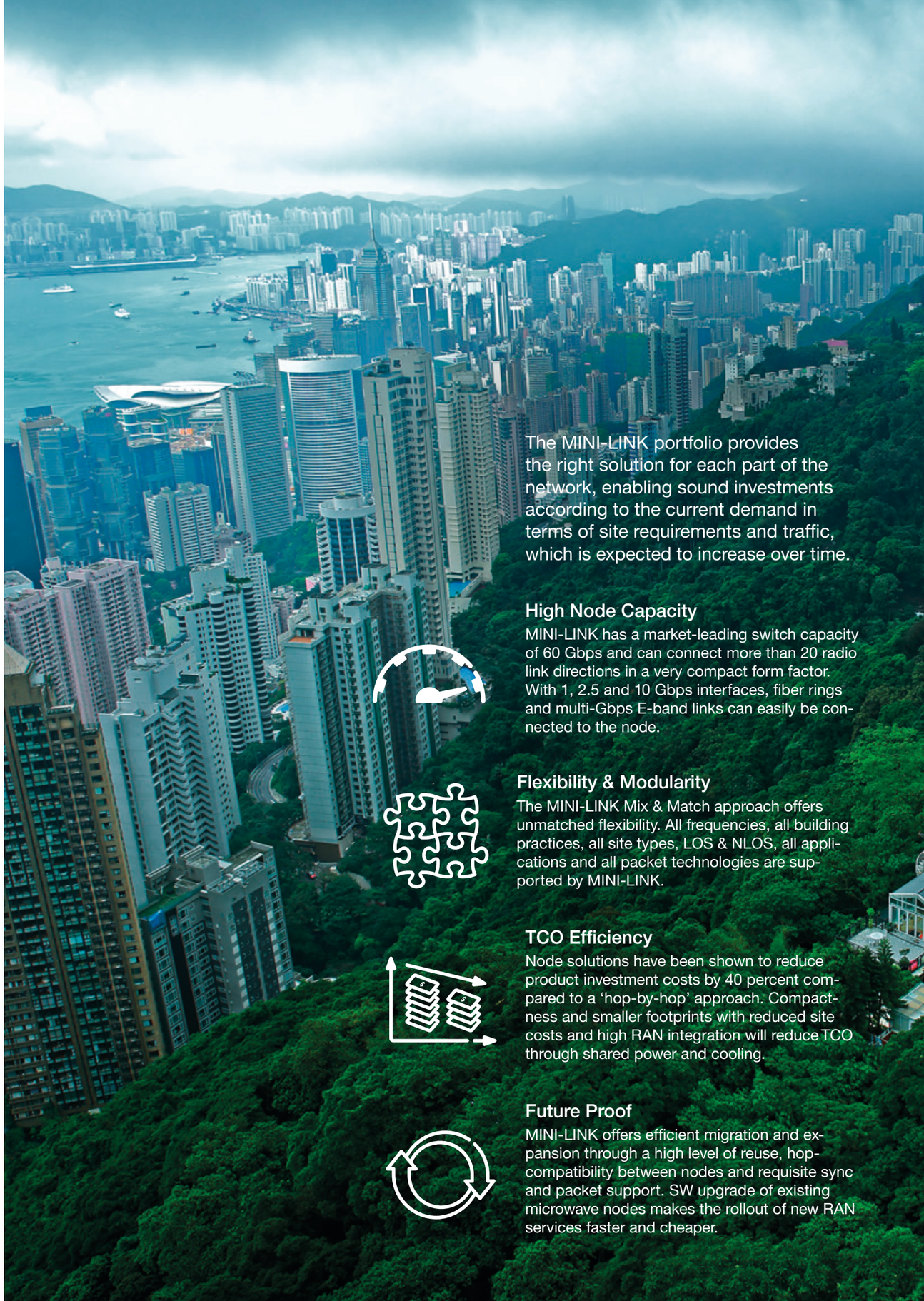
The rapidly rising capacity demands have led some market observers to point to the need for fiber, especially in metropolitan and suburban areas, and to express the view that microwave solutions will not be able to keep up in the future. The reality is somewhat different, however. Not only can microwave solutions meet virtually every conceivable backhaul requirement today, with gigabit-per-second capabilities; they will continue to evolve to meet ever-increasing capacity demands and unprecedented levels of flexibility and cost-efficiency.

In a dense urban environment, deployment of small cells with backhaul that are quick to install and have low visual impact is one of the major challenges.

By 2020 about 50% of all sites will use Microwave transmission for backhaul

The increasing complexity of current and future networks calls for flexible and well-integrated microwave nodes.

- Managed network performance
  Superior network performance is becoming increasingly important for satisfying users and reaching operators' business goals. The network must be optimized end-to-end, looking at RAN and backhaul.
- Scalable sites & networks
  Microwave equipment must be scalable; not only in capacity, but also in terms of adding new sites, new directions and new packet functionality.
- Small cells implementation
  Deploying vast numbers of outdoor small cell sites in city environments requires microwave equipment with an attractive design, that is easy to install and that can manage NLOS situations in urban areas.
- LTE migration
  New applications in LTE and LTE Advanced put new requirements on microwave equipment, for instance in terms of phase and time sync. There is also a need for higher capacity and sometimes to support new technologies.



The MINI-LINK portfolio provides the right solution for each part of the network, enabling sound investments according to the current demand in terms of site requirements and traffic, which is expected to increase over time.

High Node Capacity

MINI-LINK has a market-leading switch capacity of 60 Gbps and can connect more than 20 radio link directions in a very compact form factor. With 1, 2.5 and 10 Gbps interfaces, fiber rings and multi-Gbps E-band links can easily be connected to the node.

Flexibility & Modularity

The MINI-LINK Mix & Match approach offers unmatched flexibility. All frequencies, all building practices, all site types, LOS & NLOS, all applications and all packet technologies are supported by MINI-LINK.

TCO Efficiency

Node solutions have been shown to reduce product investment costs by 40 percent compared to a 'hop-by-hop' approach. Compactness and smaller footprints with reduced site costs and high RAN integration will reduce TCO through shared power and cooling.

Future Proof

MINI-LINK offers efficient migration and expansion through a high level of reuse, hop-compatibility between nodes and requisite sync and packet support. SW upgrade of existing microwave nodes makes the rollout of new RAN services faster and cheaper.

MIX & MATCH INVEST AS YOU GROW

By combining MINI-LINK outdoor and indoor units, all network scenarios are supported with superior performance and lowest possible cost of ownership.

The Mix and Match approach supports operators in finding solutions that enable substantial savings and superior performance. MINI-LINK supports all frequencies, all building practices, all site types, LOS & NLOS, all applications and all packet technologies. Cross-product compatibility, including hop-compatibility, allows the portfolio to function like a set of building blocks, configurable in a range of deployment scenarios. The different outdoor units offer unique flexibility in optimizing choice of building practice (all outdoor or split) and frequency band depending on specific needs and local spectrum costs. It also allows you to evolve sites over time. A built-in site switch/router also lowers operation, maintenance and power costs. These are all examples of why a mix and match approach is a more sustainable way forward for network expansion than merely looking for the lowest “box” product cost.

EVOLVE

MINI-LINK TN + MINI-LINK 6363 + MINI-LINK 6352

BUILD

MINI-LINK 6691 + MINI-LINK 6363 + MINI-LINK 6351

ADD

MINI-LINK 6351 + Switch 6391 + MINI-LINK 6351

MINI-LINK OUTDOOR PRODUCTS

MINI-LINK 6363

The world’s smallest high power radio unit

- 6-42 GHz frequency band
- 1.3 Gbps in 112 MHz
- 65% size and 35% weight reduction compared with RAU2
- Split mount with indoor modem

RAU 2X

The world´s most deployed microwave radio unit supporting any packet transport technology

- 6-42 GHz frequency band
- 680 Mbps in 56 MHz
- Split mount with indoor modem

MINI-LINK PT 2020

Simplicity & speed for packet nodes

- 6-42 GHz frequency band
- 600 Mbps in 60 MHz
- Ethernet connection to RBS or IDU

MINI-LINK PT 6020

E-band link for packet transport applications

- 70/80 GHz frequency band
- 1 Gbps capacity
- Ethernet connection to RBS or IDU

MINI-LINK 6351

The world’s smallest Gbps V-band link, optimized for small cell deployments with zero footprint

- 60 GHz frequency band
- 1 Gbps capacity
- 2.5 liter in volume–everything included in the ball
- Ethernet connection to RBS or IDU

MINI-LINK 6352

Very high capacity microwave, also suitable for fiber extension

- 70/80 GHz frequency band
- 5 Gbps capacity in 750 MHz
- 10 G interface, 2.5 G and 1 G interface to the L2 switch

Switch 6391

Compact outdoor switch with Ericsson Radio System building practice

- Multiport configurations
- Flexible interfaces
- Efficient power solution

Fronthaul 6392

All outdoor microwave providing wireless CPRI, using the E-band

- 70/80 GHz band
- 2.5 Gbps capacity for CPRI 3
- 20 µs latency for coordination

INDOOR PRODUCTS

MINI-LINK TN & CN

Widely deployed MINI-LINK TN & CN have set the standard. New NPU and MMU bring higher link and switch capacities and IP routing

- 2 carriers per modem, 4096 QAM, MIMO prepared
- 10 G, 2.5 G and 1 G interfaces
- 60 Gbps switch capacity

MINI-LINK 6691 & 6692

Highest node capacity in the smallest form factor

- 70% size reduction compared with TN
- 2 carriers per modem, 4096 QAM, MIMO prepared
- 10 G, 2.5 G and 1 G interfaces
- 60 Gbps switch capacity

MINI-LINK LH

High performance long haul system

- Up to 8 + 0 radio link bonding
- 1024 QAM support
- 2 in 1: long and short haul in one node

EVOLVE MINI-LINK NETWORKS

The MINI-LINK portfolio supports network evolution and expansion in a cost efficient way. Flexibility is key when addressing backhaul challenges. Site-specific requirements, such as time-to-market considerations and the quality of available backhaul assets, will determine the best solution.

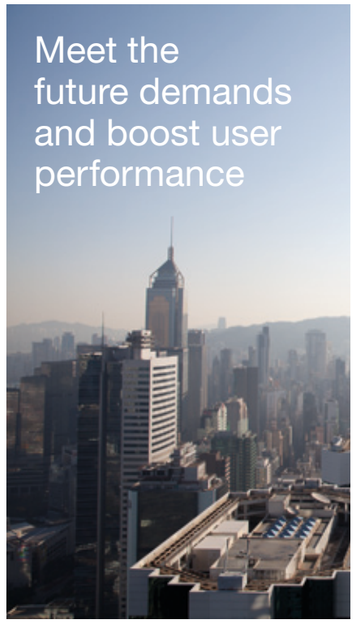
Evolve and grow by reusing existing base
In essence, the MINI-LINK portfolio provides the right solution for each part of the network. This will enable sound investments according to the current demand in terms of site requirements and traffic, which is expected to increase over time. Full flexibility, SW upgrades, nodes and hop compatibility will provide a unique opportunity to invest when and where necessary, avoiding over-dimensioning, which would entail excessive spending.

The MINI-LINK nodes use plug-in units, which make it easy to customize configurations and make future upgrades. By reusing existing MINI-LINK equipment, filling up empty slots and just adding a new modem and radio, the savings can be up to 40%. With MMU4 A you can enable higher capacities in MINI-LINK TN with 4096 QAM. With NPU 1D in MINI-LINK TN 20p, higher switch capacities and 10G interfaces can be used. When even higher capacities are needed, just add a MINI-LINK 6352 to your MINI-LINK TN to enable up to 10 Gbps capacities. For cost efficient network expansion, MINI-LINK 6691/6692 is hop-compatible with MINI-LINK TN.

To add small cell hops to your MINI-LINK TN aggregation site, use MINI-LINK 6351 and use the available Ethernet interfaces.

Packet evolution
As networks evolve with more advanced structures like rings or meshed, a routed network can gradually be implemented. With IP routing, it is possible to terminate layer 2 domains, support redundant topologies and measure end-to-end IP service performance. Since MINI-LINK has built-in Ethernet Switching and IP Routing functionality, cost and complexity will be reduced by eliminating the need for external equipment.

Wireless Fronthaul
The connection between the radio and the baseband in RAN is referred to as 'fronthaul' and is connected through a CPRI interface. Fronthaul is the transport means to connect multiple macro cells or small cells in a coordinated and centralized RAN. It is not uncommon for fronthaul links to require multiples of Gbps of capacity with sub-millisecond latency. The most common fronthaul solution is fiber but it is also possible to implement fronthaul systems over high performance wireless links. Fronthaul 6392 is an all-outdoor and zero footprint microwave product designed for wireless fronthaul applications.



Ericsson Radio System
The Ericsson Radio System is an end-to-end modular system for building radio access networks with integrated backhaul solutions run by one network management system. MINI-LINK is a fully integrated part of the Ericsson Radio System with pre-tested and verified solutions that work seamlessly together with the other elements of the radio system such as baseband, enclosures and power solutions.

With the Ericsson Radio System, we are moving from the fairly static environment of a cabinet-based site to a more modular system that can be adapted to specific operator needs. The EC bus in the Ericsson Radio System, is a small plug that makes a big difference. It allows you to connect all of the equipment on a site. It provides power savings and reduced noice levels as climate control enables the node to request varying levels of cooling. It also simplifies operations and maintenance with node inventory information.

Ericsson Network Manager
The Ericsson Network Manager makes it possible to handle all network technologies through the same management platform. This ranges from the different radio access technologies through Wi-Fi, microwave, optical, Ethernet to IP, circuit and packet core and IMS and VoLTE.

Services
Ericsson offers a complete set of services for mobile backhaul, ranging from consulting and learning to management services.

MINI-LINK the market leader
MINI-LINK is the market leader in microwave transmission. With 840 customers in 175 countries, MINI-LINK is in use in all of the world's climate zones. Ericsson has delivered over 3.2 million microwave radio units, beginning in the late 1970s. One third is used for transport packet traffic, which makes Ericsson the number one supplier of packet microwave.

MINI-LINK is the market leader in microwave transmission. With 840 customers in 175 countries

3200000

Ericsson has delivered over 3.2 million microwave radio units

Leading transformation through mobility

We are a world leader in the rapidly changing environment of communications technology – providing equipment, software and services to enable transformation through mobility.

Some 40 percent of global mobile traffic runs through networks we have supplied. More than 1 billion subscribers around the world rely every day on networks that we manage. With more than 37,000 granted patents, we have one of the industry's strongest intellectual property rights portfolios.

Our leadership in technology and services has been a driving force behind the expansion and improvement of connectivity worldwide. We believe that through mobility, our society can be transformed for the better. New innovations and forms of expression are finding a greater audience, industries and hierarchies are being revolutionized, and we are seeing a fundamental change in the way we communicate, socialize and make decisions together.

These exciting changes represent the realization of our vision: a Networked Society, where every person and every industry is empowered to reach their full potential.

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