MINI-LINK™ CN, ETSI

ERICSSON'S COST EFFICIENT COMPACT NODES FOR HOPS AND ACCESS SITES

MINI-LINK CN is a compact and easy to install microwave transmission node built with simplicity in mind. MINI-LINK CN is optimized for end sites, single hops, and enterprise networks. There are a number of MINI-LINK CN products, MINI-LINK CN 210, MINI-LINK CN 500 and MINI-LINK CN 510, each of them specifically optimized for a certain type of site.

Ericsson has over 40 years of microwave experience with more than 2 million radio units delivered to over 160 countries. MINI-LINK is produced in the world's largest microwave production facility and has a market leading reliability. Ericsson is the market leader in microwave transmission.

MINI-LINK CN
IS HOP COMPATIBLE WITH
MINI-LINK TN & MINI-LINK PT 2010

MINI-LINK CN is used in a number of different scenarios:

- **New roll-out of mobile backhaul networks;** in mobile backhaul networks MINI-LINK CN is a perfect fit at the access site with MINI-LINK TN on the other side of the hop, at the aggregation site, supporting the packet network end to end.

- **Evolution of mobile backhaul networks;** MINI-LINK CN supports Native Ethernet as well as Native TDM and a mix of them. This enables our customers to start with TDM traffic, add Ethernet when data traffic increases, and move to all Ethernet when required. MINI-LINK CN can be a perfect upgrade of MINI-LINK E at end sites.

- **Fixed Broadband over Microwave; connecting En**terprises or rural areas to existing transport networks with microwave is a well proven cost efficient solution.

- **Enterprise, Broadcasting and National security customers can** successfully deploy both single hops, and complete backhaul networks.

High capacity microwave
MINI-LINK CN provides up to gigabit capacity at telecom grade availability. With 1 Gbps over the hop, MINI-LINK CN supports the capacities required by LTE. Our best in class radio output power provides longer hops with smaller antennas.

Handling your IP network evolution
MINI-LINK CN supports any network scenario; both new packet-only networks as well as evolutions from TDM to packet. It fully supports carrier grade networks with Native Ethernet and carrier-grade QoS for Ethernet, IP as well as MPLS and sync distribution in packet networks.

MINI-LINK CN also provides Layer 1 sync distribution to your existing network and introduces no extra delay or delay variation.

MINI-LINK CN is a complete solution for the evolution of your network. The Hybrid Radio Link transports both Native Ethernet and Native PDH simultaneously over the same hop, which is perfect for a cost-effective TDM to packet migration. Start with all E1s or a mix with Ethernet. Add more Ethernet as data traffic increases and complete the migration by moving to all-Ethernet.

Saves cost
MINI-LINK CN is a Cost Saver; it is compact and easy to install. The all-outdoor solution speeds up and facilitates roll out even further with no need for a site building. Existing MINI-LINK customers can save time, money, space and reduce upgrade risks by re-use of the installed base; introduce Native Ethernet at end nodes by replacing MINI-LINK E with the space optimized MINI-LINK CN, without replacing the actual outdoor units, nor the cabling to the outdoor units.

The market leading reliability of MINI-LINK includes a field proven MTBF of typically over 70 years.

MINI-LINK CN IS COMPACT AND EASY TO INSTALL

COMPARISON MINI-LINK CN 210, 500 & 510

	MINI-LINK CN 210 1.1	MINI-LINK CN 500	MINI-LINK CN 510 1.0
	Cost efficient: Small aggregation sites / Single hops / Access sites	Cost efficient: Single hops / Access sites	Cost efficient: Small aggregation sites / Single hops / Access sites
	Hop compatible with MINI-LINK TN & MINI-LINK PT 2010	Hop compatible with MINI-LINK TN & MINI-LINK PT 2010	Hop compatible with MINI-LINK TN & MINI-LINK PT 2010
CAPACITY	Up to 430 Mbps over the hop in one frequency channel	Up to 500 Mbps over the hop in one frequency channel	Up to 1 Gbps over the hop in one frequency channel w. XPIC and 2 IDU's
CONFIGURATIONS	1+0 and 1+1 working and hot standby	1+0 and 1+1 hot standby	1+0 and 1+1 working and hot standby 2x(1+0) with XPIC 2+0 with XPIC supporting Radio Link Bonding*
FREQUENCIES AND MODULATIONS	C-QPSK in 7 – 28 MHz channels 4-256 QAM in 7 – 56 MHz Adaptive Modulation	C-QPSK in 7 – 28 MHz channels 4-512 QAM in 7 – 56 MHz Adaptive Modulation	C-QPSK in 7 – 28MHz channels 4-512 QAM in 7 – 56 MHz Adaptive Modulation XPIC
INTERFACES	Ethernet: Up to 4x 10/100/1000 BASE-T and up to 2 x SFP (max 4 Eth ports) PDH: 16 x E1, 120 or 75 Ohm** (2 x E1 per RJ-45) O&M / Site LAN: 100BASE-T User I/O: 4 Input + 2 Output	Ethernet: 1 x 10/100/1000 BASE-T PDH: 16x E1, 120 or 75 Ohm (Sofix) Q&M / Site LAN: 100BASE-T User I/O: 4 input + 2 output	Ethernet: 4 x 10/100/1000 BASE-T + 2 x SFP PDH: 16 x E1, 120 or 75 Ohm*** (2 x E1 per RJ-45) PDH: 16 x DS1* O&M / Site LAN: 100BASE-T User I/O: 4 input + 2 output
POWER CONSUMPTION (RAU WITH DUAL VOLTAGE CAPABILITY)	35W 1+0 configuration	18 W 1+0 configuration 18 W 1+1, active configuration 15 W 1+1, stand-by configuration	35 W 1+0 configuration
ETHERNET SWITCHING	Q bridge – 5 Gbps non-blocking switch capacity, full-duplex Provider Bridge*		Q bridge – 7 Gbps non-blocking switch capacity, full-duplex Provider bridge*
QOS	Ethernet, IP and MPLS priority aware QoS - 8 priority levels - Policing, SP, WFQ and WRED	Ethernet, IP and MPLS priority aware QoS - 8 priority levels - SP	Ethernet, IP and MPLS priority aware QoS - 8 priority levels - Policing, SP, WFQ and WRED
NETWORK SYNCHRONIZATION	Support for sync transport: - 2 MHz acc G.703§13 - 2 Mbps G.703§9 1 RJ-45 dedicated port for 1 input and up to 3 output synchronization interfaces Sync Ethernet support according to ITU-T G.8261, 8262, 8264	Support for sync transport: - 2 MHz acc G.703§13 - 2 Mbps G.703§9 The input/output interface is an E1 (2 Mbps) Sofix port among the 16 inputs on the front pane	Support for sync transport: - 2 MHz acc G.703§13 - 2 Mbps G.703§9 1 RJ-45 dedicated port for 1 input and up to 3 output synchronization interfaces Sync Ethernet support according to ITU-T G.8261, 8262, 8264
ETHERNET FUNCTIONS	VLAN, LAG (Link Aggregation Group), STP/RSTP/MSTP, 9k Jumbo frames Ethernet PM counters - Continuous - During intervals*	Continuous Ethernet PM counters	VLAN, LAG (Link Aggregation Group), STP/RSTP/MSTP, 9k Jumbo frames Radio Link Bonding* Ethernet PM counters - Continuous - During intervals*
POWER SUPPLY	-48 V DC and +24 V** DC, with redundant power supply	-48 V DC and + 24 V DC, with redundant power supply	-48 V DC and +24 V** DC, with redundant power supply
WEIGHTS AND DIMENSIONS (HXWXD)	3,1 kg, 240 x 440 x 45 mm	3 kg, 215 x 445 x 44 mm	3,1 kg, 240 x 440 x 45 mm

*available in a later release via SW upgrade
** +24 V provided by external device
*** 75 Ohm will be provided via specific ICF external panel

MINI-LINK CN 210 1.1

MINI-LINK CN 500

MINI-LINK CN 510 1.0

Network Synchronization
MINI-LINK CN 500 supports transport of synchronization signal across the hop.
The synchronization signal is carried over the radio hop without occupying any bandwidth allocated for payload traffic.

Delay
Regarding delay performance, delay per link for Priority traffic is <0.8 ms for radio link (TDM and Packet) capacities below 50 Mbit/ s and <0.5 ms for radio link capacities above 50 Mbps. Delay Variation for priority traffic is <0.5 ms per link.

Hybrid Radio Link
Native Ethernet and Native PDH are supported over the microwave radio link. The maximum net rate over one radio is up to 400 Mbps per radio.

TECHNICAL SPECIFICATIONS

ANTENNAS
- 0.2/0.3/0.6/0.9/1.2/1.8 m single polarized antennas for integrated and separate installation
- 2.4/3.0/3.7 m single polarized antennas for separate installation
- 0.3/0.6 m dual polarized antennas for integrated and separate installation
- 1.2/1.8/2.4/3.0/3.7 m dual polarized antennas for separate installation

INTEGRATED POWER SPLITTERS
Available in symmetrical and asymmetrical versions

POWER CONSUMPTION
Radio Terminal: 30-110 W
(depending on configuration)

WEIGHTS AND DIMENSIONS (HXWXD)
Radio unit
6/7/8/10/11/13/15/18/23/26/28/32/38 GHz
4 kg, 321x260x97 mm

TRAFFIC INTERFACES
See Table

PROTECTION INTERFACE
See Table

MAINTENANCE INTERFACE
10/100 BASE-T IEEE802.

DIAGNOSTIC FUNCTIONS
Line, local, and connection loops.

STANDARDS AND RECOMMENDATIONS
ETSI, ITU, IEC, IEEE, IETF

OPERATIONAL TEMPERATURE
Outdoor, full functionality: -50°C to + 60°C
Indoor, full functionality: -25°C to + 55°C

DATA COMMUNICATION NETWORK
DCN interfaces (SITELAN and Local)
via 10/100 BASE-T

TECHNICAL DATA

Frequency (GHz)	6L 6U	7 8	10	11	13 15	18 23	26	28	32	38
Max. RF output power (dBm)										
512 QAM***	25	25	24	24	20	17	19	18	16	16
256 QAM	+23	+25	+19	+24	+20 +24*	+17 +22*	+19	+18	+18	+16
128 QAM	+24	+26	+20	+25	+21 +25*	+18 +23*	+20	+19	+19	+17
64 QAM	+24	+26	+20	+25	+21 +25*	+18 +23*	+20	+19	+19	+17
16 QAM	+27	+27	+22	+26	+22 +26*	+19 +24*	+21	+21	+21	+19
4 QAM	+29	+29	+24	+28	+25 +29*	+24 +27*	+23	+22	+22	+20
C-QPSK	+30	+30	+25	+29	+25 +29*	+24 +27*	+24	+23	+23	+21

* RAU X HP

Min. RF output power (dBm)										
All modulation schemes	-5	-5	-10	-8	-10	-10	-10	-10	-10	-10

*Spectral class efficiency

** Dependent on packet size

***512 QAM is available for MINI-LINK CN 500 and MINI-LINK CN 510

TECHNICAL DATA

Receiver threshold BER 10^{-6} (dBm)

Frequency (GHz)	6L	7	10	11	13	18	26	28	32	38	42
Net Throughput	6U	8			15	23					

Ethernet [Mbps] Air (Line Interface**)	TDM		6L	7	10	11	13	18	26	28	32	38	42
8	4E1	C-QPSK/7 MHz	-91	-91	-91	-91	-91	-90	-90	-89	-89	-88	-87
10 (10-12)	5E1	4QAM/7 MHz	-92	-92	-92	-92	-92	-91	-91	-90	-90	-89	-88
21 (20-21)	8E1	16QAM/7 MHz	-85	-85	-85	-85	-85	-84	-84	-83	-83	-82	-81
30 (30-37)	15E1	64QAM/7 MHz	-78	-78	-78	-78	-78	-77	-77	-76	-76	-75	-74
35 (35-43)	16E1	128QAM/7 MHz	-75	-75	-75	-75	-75	-74	-74	-73	-73	-72	-71
16 (16-20)	8E1	C-QPSK/14 MHz	-88	-88	-88	-88	-88	-87	-87	-86	-86	-85	-84
22 (21-26)	11E1	4QAM/14 MHz	-89	-89	-89	-89	-89	-88	-88	-87	-87	-86	-85
42 (45-56)	16E1	16QAM/14 MHz	-82	-82	-82	-82	-82	-81	-81	-80	-80	-79	-78
63 (64-79)	16E1	64QAM/14 MHz	-76	-76	-76	-76	-76	-75	-75	-74	-74	-73	-72
72 (71-88)	16E1	128QAM/14 MHz	-73	-73	-73	-73	-73	-72	-72	-71	-71	-70	-69
81 (84-103)	16E1	256QAM/14MHz	-69	-69	-69	-69	-69	-68	-68	-67	-67	-66	-65
33 (32-39)	16E1	C-QPSK/28 MHz	-85	-85	-85	-85	-85	-84	-84	-83	-83	-82	-81
46 (46-57)	16E1	4QAM/28 MHz	-85	-85	-85	-85	-85	-84	-84	-83	-83	-82	-81
94 (94-116)	16E1	16QAM/28 MHz	-79	-79	-79	-79	-79	-78	-78	-77	-77	-76	-75
138 (138-170)	16E1	64QAM/28 MHz	-72	-72	-72	-72	-72	-71	-71	-70	-70	-69	-68
160 (154-109)	16E1	128QAM/28 MHz	-69	-69	-69	-69	-69	-68	-68	-67	-67	-66	-65
180 (180-222)	16E1	256 QAM/28 MHz	-65	-65	-65	-65	-65	-64	-64	-63	-63	-62	-61
200(200-247)	16E1	512QAM/28 MHz***	-62	-62	-62	-62	-62	-61	-61	-60	-60	-59	-58
65(65-80)	16E1	4QAM/40 MHz	-83	-83	-83	-83	-83	-82	-82	NA	NA	NA	NA
133(133-164)	16E1	16QAM/40 MHz	-77	-77	-77	-77	-77	-76	-76	NA	NA	NA	NA
167(167-206)	16E1	32QAM/40 MHz	-74	-74	-74	-74	-74	-73	-73	NA	NA	NA	NA
197 (199-246)	16E1	64QAM/40 MHz	-70	-70	-70	-70	-70	-69	-69	NA	NA	NA	NA
229(229-283)	16E1	128QAM/40 MHz	-67	-67	-67	-67	-67	-66	-66	NA	NA	NA	NA
257(257-317)	16E1	256QAM/40 MHz	-64	-64	-64	-64	-64	-63	-63	NA	NA	NA	NA
286(287-353)	16E1	512QAM/40MHz***	-61	-61	-61	-61	-61	-60	-60	NA	NA	NA	NA
94(94-116)	16E1	4QAM/56 MHz	-82	-82	-82	-82	-82	-81	-81	-80	-80	-79	-78
189 (189-233)	16E1	16QAM/56 MHz	-75	-75	-75	-75	-75	-74	-74	-73	-73	-72	-71
237(237-292)	16E1	32QAM/56 MHz	-72	-72	-72	-72	-72	-71	-71	-70	-70	-69	-68
285(285-352)	16E1	64QAM/56 MHz	-68	-68	-68	-68	-68	-67	-67	-66	-66	-65	-64
327 (325-400)	16E1	128QAM/56 MHz	-65	-65	-65	-65	-65	-64	-64	-63	-63	-62	-61
369(346-426)	16E1	256QAM/56 Mhz	-62	-62	-62	-62	-62	-61	-61	-60	-60	-59	-58
406(501-407)	16E1	512QAM/56 MHz***	-59	-59	-59	-59	-59	-58	-58	-57	-57	-56	-55

*Spectral class efficiency

** Dependent on packet size

***512 QAM is available for MINI-LINK CN 500 and MINI-LINK CN 510

ATPC	Available in all frequencies - minimum -1 dBm, with configured maximum power
Frequency stability	± 10 ppm

CARRIER ETHERNET
MEF
Certified Compliant