Small Cell Solutions

Enterprise In-Building Solution

E-RAN RN-310 Radio Node

- Multi-Access* and Dual-Band LTE** Small Cell supporting concurrent, UMTS and LTE operation*, and operation on two LTE carriers with option for Carrier Aggregation(CA)**

- Multiple FDD band combinations

- 32 UMTS channels*

- 64 active LTE users, up to 128 LTE RRC Connections (per band class**)

- 21/5 Mbps peak DL/UL UMTS throughput*

- 150/50 Mbps peak DL/UL LTE throughput (for a 20MHz channel)

- 300 Mbps peak DL LTE throughput with 2x20MHz CA**

- Deployable over existing Ethernet switching infrastructure (VLAN)

- Power-over-Ethernet (PoE+)

- Wall and ceiling mountable

- Certificate-based authentication with E-RAN Services Node

High Performance Multi-Access 3G & 4G* and Dual-Band LTE** Small Cell for Scalable Indoor and Venue Deployments

The RN-310 is a family of radio nodes, and have Multi-Access UMTS and LTE * and Dual-Band LTE** radio nodes with Self-Organizing Networks (SON) Capability.

As the demand for mobile broadband accelerates, mobile network operators need to efficiently utilise both UMTS and LTE* and all LTE spectrum assets** and technologies, without creating new network complexity.

NEC's scalable small cell system, called an Enterprise Radio Access Network (E-RAN), hides the complexity of radio management and mobility and provides operators with a single touch point to aggregate and manage a large network of UMTS, LTE, and Multi-Access (UMTS and LTE) small cells* operating either on single- or dual-carriers of LTE**.

NEC E-RAN with PoE LAN-to-Core Network

UMTS Radio

Each Multi-Access RN-310 supports up to 32 simultaneous UMTS voice and data channels; a peak downlink rate of 21 Mbps and a peak uplink rate of 5 Mbps. E-RAN implements receive diversity for superior uplink performance and implements soft handovers.

LTE Radio

Each Multi-Access* and Dual-Band LTE** RN-310 supports up to 64 active LTE users and up to 128 RRC Connections per LTE carrier. When used with 20 MHz channel bandwidth, it supports a peak downlink rate of 150 Mbps and a peak uplink rate of 50 Mbps.

Each Dual-Band LTE SCRN-310 supports 2x2 MIMO operation on two separate LTE bands, enabling higher user capacity and average data rates per Radio Node coverage footprint.

Self Organising Networks

The Radio Node implements SON capability by listening to other Radio Nodes within the E-RAN and neighbouring LTE, UMTS, and GSM macro cells in multiple frequency bands, and performing continuous self-optimisation to provide high-quality radio coverage and mobility.
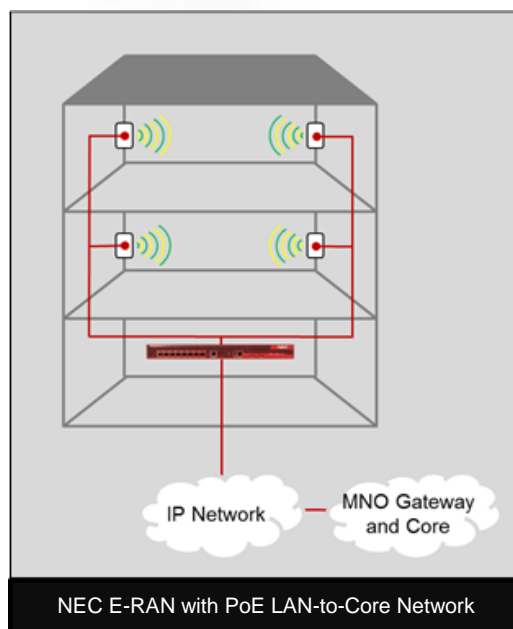
Easy to Install

E-RAN Radio Nodes can be installed on walls or ceilings. Both network connectivity and power are provided over Ethernet. The Radio Node has no fans and is completely convection cooled. Antennas are built-in for both UMTS and LTE.

Secure

RN-310 utilises on-chip Trusted Platform Module (TPM) functions to implement secure boot, and establish certificate-based IPsec tunnel to the E-RAN Services Node for all UMTS and LTE traffic. There is no management or console port on the Radio Node, and the Radio Node can be physically locked to prevent theft.

* Dual Mode ** Dual Band

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Small Cell Solutions

Feature	Specification	Feature	Specification
PHYSICAL SPECIFICATION		**SYSTEM SPECIFICATIONS**	
Enterprise Installation	Mounting hardware included Padlock option Ceiling or wall mount Power-over-Ethernet: 802.3at Maximum power consumption: 23 W	Security	Secure boot and secure key storage using Trusted Platform Mod IPsec tunneling to services node X.509 certificate-based authentication
LED Indication	1 x tri-color LED (RGB) Status indications: boot, normal, disabled, fault, emergency call, radio node tracking	Timing & Synchronisation	IEEE 1588v2 based (PTP) Real-time synchronization to Services Node

Physical and Environmental	Dimensions: 239 x 206 x 53 mm (9.4 x 8.1 x 2.1 in)
	Weight: <1.5 Kg
	1 x 100/1000 Mb/s Ethernet interface (RJ45)
	Operating temperature:
	  - 0 to 50°C (vertically mounted)
	  - 0 to 40°C (horizontally mounted)
	Storage temperature: 0 to 85°C
	Operating humidity: 0 to 90% non-condensing
	Storage humidity: 0 to 90% non-condensing
	Ingress protection rating: IP30		

		UMTS RADIO SPECIFICATION	
LTE RADIO SPECIFICATION		Performance	Up to 32 simultaneous voice and data channels Peak rates: 21 Mbps DL and 5 Mbps UL
Performance	Peak rates: 150/50 Mbps DL/UL (with 20 MHz) or 300/50 Mbps DL/UL (with 2x20MHz CA)** 64 active users per band 128 RRC Connections per band	Radio and Antenna	Peak transmit power: 1x 250mW (24dBm) Receive diversity Two internal antennas Antenna gain: 2dBi
Channel Sizes	3(Band 3 only), 5, 10, 15, 20 MHz	RF Management	UMTS network monitor Inter and intra-frequency neighbour cell detection GSM network monitor Auto detection of primary scrambling codes
Radio and Antenna	2 x 2 MIMO per LTE band Maximum transmit power: 2x125 mW (24 dBm) Two internal antennas Antenna gain: 2 dBi	Mobility Management	Inter small-cell soft handover Handover from small-cell cluster to macrocell (iintra/nter RAT)
Mobility	Inter Radio Node handover anchored at Services Node S1 Handover to/from macro (inter-frequency, intra-frequency CSFB to UMTS & GSM SRVCC to UMTS	RAB Support	CS: 12.2 Kbps AMR, WB-AMR R99 PS: 64kbps, 384 Kbps HSPA+: Rel 7, all categories Multi-RAB: 1 X CS, up to 3 X PS
RF Management	LTE and UMTS Network Listen (NL) Inter and intra-frequency neighbor cell detection Auto detection of Physical Cell Identities (PCI) Automatic Neighbour Relation (ANR) management	Ciphering	3G Kasumi
Voice Services	VoLTE Circuit Switched Fall Back (CSFB)	**REGULATORY COMPLIANCE AND CERTIFICATION**	

QoS Features	Support for LTE QCIs (1-9)
	4Data Radio Bearers (DRB) per UE
	Guaranteed Bit Rate (GBR)
	Maximum Bit Rate (MBR)
	Aggregate Maximum Bit Rate (AMBR)
		Certification	Safety: EN 60950, CB certification (IEC 60950)
			EMI Directive 1999/5/EC on R&TTE:
			  - EN 50385
			  - EN 301 489-1 and 301 489-23
			  - EN 301 908-1 and 301 908-3
			FCC Part 15, Class A
			Industry Canada: ICES-003 (Class A)
			Materials: Directive 2002/95/EC on RoHS
			General: CE and NRTL marking
			FCC Part 24 (UMTS Band II)
			FCC Part 27 (UMTS Band IV)
			Industry Canada: RSS-133, RSS-139

Ciphering	SNOW 3G and AES air interface encryption		

PRODUCT OPTIONS

Multi-Access Radio Nodes		Dual-band Radio Nodes	
RN-310-0701 **RN-310-0701-E**	Operates in Band Class 7 (LTE) Operates in Band Class 1 (3G) Monitors LTE B3/B7/B20, UMTS B1/B8, GSM 900/1800	**RN-310-0413** **RN-310-0413-E**	Operates in Band Class 4 (LTE) Operates in Band Class 13 (LTE) Monitors LTE B4/B13
RN-310-0402 **RN-310-0402-E**	Operates in Band Class 4 (LTE) Operates in Band Class 2 (3G) Monitors LTE B4, UMTS B2/B4/B5, GSM 850/1900	**RN-310-0703** **RN-310-0703-E**	Operates in Band Class7 (LTE) Operates in Band Class 3 (LTE) Monitors LTE B3/B7/B20, UMTS B1/B8, GSM 900/1800 MHz
RN-310-0301 **RN-310-0301-E**	Operates in Band Class 3 (LTE) Operates in Band Class 1 (3G) Monitors LTE B3/B7/B20, UMTS B1/B8, GSM 900/1800		

Note: Radio nodes with the external antenna option are suffixed by "E" (External).
For example "RN-310-0701-E" is the Band 7 LTE Band 1 UMTS RN with external antenna.

Any technical specifications contained herein are subject to change without notice.

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