Small Cell Solutions

Enterprise In-Building Solution
E-RAN RN-310 Radio 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**.

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. 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
## Feature Specification

### PHYSICAL SPECIFICATION

**Enterprise Installation**
- Mounting hardware included
- Padlock option
- Ceiling or wall mount
- Power-over-Ethernet: 802.3at
- Maximum power consumption: 23 W

**LED Indication**
- 1 x tri-color LED (RGB)
- Status indications: boot, normal, disabled, fault, emergency call, radio node tracking

**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 10/100/1000 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

### SYSTEM SPECIFICATIONS

**Security**
- Secure boot and secure key storage using Trusted Platform Module (TPM) functions
- IPsec tunneling to services node
- X.509 certificate-based authentication

**Timing & Synchronisation**
- IEEE 1588v2 based (PTP)
- Real-time synchronisation to Services Node

**LED Indication**
- 1 x tri-color LED (RGB)
- Status indications: boot, normal, disabled, fault, emergency call, radio node tracking

### UMTS RADIO SPECIFICATION

**Radio and Antenna**
- Peak transmit power: 2x125 mW (24 dBm)
- Two internal antennas
- Antenna gain: 2 dBi

**Mobility**
- Inter RADIO Node handover anchored at Services Node
- S1 Handover to/from macro (inter-frequency, inter-frequency)
- CSFB to UMTS
- SRVCC to UMTS

**RAB Support**
- CS: 12.2 Kbps AMR, 48 Kbps
- R99 PS: 64 Kbps, 384 Kbps
- HSPA+: Rel 7, all categories
- Multi-RAB: 1 X CS, up to 3 X PS

### LTE RADIO SPECIFICATION

**Performance**
- Peak rates: 15/50 Mbps DL/UL (with 20 MHz)
- 64 active users per band

**Radio and Antenna**
- Peak transmit power: 1x 250mW (24dBm)
- Two internal antennas
- Antenna gain: 2 dBi

**Mobility**
- Inter small-cell soft handover
- Handover from small-cell cluster to macrocell (inter-RAT, inter-frequency)

**RAB Support**
- CS: 12.2 Kbps AMR, 48 Kbps
- R99 PS: 64 Kbps, 384 Kbps
- HSPA+: Rel 7, all categories
- Multi-RAB: 1 X CS, up to 3 X PS

### Ciphering
- SNOW 3G and AES air interface encryption

### PRODUCT OPTIONS

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

#### Dual-band Radio Nodes
- **RN-310-0413**
  - Operates in Band Class 4 (LTE)
  - Operates in Band Class 3 (LTE)
  - Monitors LTE B4/B13
- **RN-310-0703**
  - Operates in Band Class 7 (LTE)
  - Operates in Band Class 3 (LTE)
  - Monitors LTE B3/B7/B20, UMTS B1/B8, GSM 900/1800 MHz

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