

# ALCATEL-LUCENT LIGHTRADIO™ 9764 METRO CELL OUTDOOR V1 LTE 2x1W B7

The Alcatel-Lucent 9764 lightRadio™ Metro Cell Outdoor V1 LTE 2x1W B7 (MCO V1 LTE B7) is a next generation All-in-One metro cell based on the Alcatel-Lucent ground-breaking lightRadio™ cube technology that brings together the latest innovations in antennas, amplifiers and transceivers to minimize size and improve radio frequency (RF) performance. Operating in the B7 frequency band, the Alcatel-Lucent lightRadio™ 9764 Metro Cell Outdoor V1 2x1W LTE B7 uses integrated directional antennas to cost effectively extend LTE coverage and capacity to dense urban areas. The lightRadio™ 9764 MCO V1 LTE B7 is ideal for covering hot spots such as restaurants, shops, hotels and offices from an outdoor location. Additionally, the 9764 MCO V1 LTE B7 can also cover city streets with a significant range.



The Alcatel-Lucent 9764 lightRadio™ Metro Cell Outdoor V1 LTE 2x1W is part of the lightRadio family of products. It is easily deployed almost anywhere without the complexity or cost associated with traditional macro cell site installation. With its small dimensions and volume, the Alcatel-Lucent lightRadio™ 9764 Metro Cell Outdoor V1 LTE 2x1W may be mounted on a lamppost, pole or on the side of a building to deliver coverage and capacity directly to where it is needed. Network deployment and optimization costs of the Alcatel-Lucent 9764 lightRadio™ Metro Cell Outdoor V1 LTE 2x1W are also significantly reduced with Self-Organizing Network (SON) features, powered by Bell Labs innovations. SON technology increases operational efficiency and network performance by automating network configuration and optimization. The Alcatel-Lucent 9764 lightRadio™ Metro Cell Outdoor V1 LTE 2x1W is the latest enhancement to the industry leading Alcatel-Lucent Small Cell solutions.

Alcatel-Lucent 9764 lightRadio™ Metro Cell Outdoor V1 LTE 2x1W is a component of the family concept, characterized by usage of the Alcatel-Lucent 9764 Metro Dock used for mechanical support and transmission. The Alcatel-Lucent 9764 lightRadio™ Metro Cell Outdoor V1 LTE 2x1W backhaul is modular. This product can also support the Alcatel-Lucent 9764 MCO Wi-Fi Access Point.

## Features

- Small, lightweight unit that is virtually invisible when mounted a lamppost, pole, or wall
- Integrated fully digital directional antennas enabling higher throughput, lower interference and greater power efficiency
- Single LTE carrier at 2x 1W (2x5W EIRP) equivalent isotropically radiated power (EIRP) with 7 dBi integrated antenna gain
- Two path receive diversity

- Standard 2x2 MIMO configuration, 2 transmit and 2 receive diversity
- Modular integrated Alcatel-Lucent 9764 Metro Dock is design to support multiple backhaul options, including Gigabit Ethernet (GbE)
- Optional dual-band Alcatel-Lucent 9764 MCO Wi-Fi access point plugging into Metro (common look & feel, joint backhauling, integrated antenna)
- Peak rate support (75Mb/s down link and 33 Mb/s uplink at 10 MHz)
- 3GPP Release 8 & 9 compliant
- Supports standard S1 and X2 interface
- Handovers to and from macro network
- Self-organizing network (SON) capabilities
- Real-time operational status and service monitoring

## Benefits

- Easily deployed almost anywhere
- High range of coverage with strong signal strength within the coverage area
- Fast and reliable data connections and high data throughput
- Network deployment flexibility
- Extends LTE macro coverage and capacity to both outdoor and indoor locations with a low total cost of ownership (TCO)
- Enhanced performance and fault management for public, operator-owned small cells
- Seamless mobility with simultaneous voice and data service continuity within a metro cell group and with the macro network

## Technical specifications

### Physical dimensions

- Height x Width x Depth: 501x 178x 164mm (without metro Dock and Wi-Fi AP)
- Volume: 13.6 L (without Metro Dock, Wi-Fi AP and mounting kit)

### Weight

- Weight : 9.1 kg (without Metro Dock, Wi-Fi AP and mounting kit)

### Mount

- Lamppost, pole or wall mountable
- Vertical orientation

### Power Supply

- 110 to 220V AC
- Typical power consumption at ambient temperature:
- 90W with GbE backhaul
- 100W with GbE backhaul and Wi-Fi Access Point

### Interfaces

- GbE over Small Form Factor Pluggable (SFP) electrical or optical GPON (SFP)

### Optional Wifi Access Point

- Dual-Band: Simultaneous support of 2.4 / 5 GHz (802.11 b/g/n, 802.11a/n)
- Supports carrier grade WiFi

- Integrated antenna in the module

### Certification

- CE
- UL

### Compliance

- RoHS
- WEEE
- IP65

### Temperature Range

- -40°C (-40°F) to +55°C (131°F) (with solar shield)

### Radio Characteristics

- Operating bands: 3GPP band 7 Maximum

- Maximum transmission power: 2x1W (30dBm per antenna port)
- Directional antenna with 7dBi gain
- 2X2 MIMO; 2 transmit and 2 receive diversity
- Baseband capacity: 64 simultaneous active users,
- Receive sensitivity: -98 dBm at antenna port connector

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# ALCATEL-LUCENT 9764 METRO CELL OUTDOOR V1.0 B1 W-CDMA 1W

## SMALL CELL RELEASE BCR 2.4.1

The Alcatel-Lucent 9764 Metro Cell Outdoor (MCO) V1.0 B1 Wideband Code Division Multiple Access (W-CDMA) 1W is a next-generation all-in-one metro cell based on the Alcatel-Lucent groundbreaking lightRadio™ cube that brings together the latest innovations in antennas, amplifiers and transceivers to minimize size and improve radio frequency (RF) performance. Operating in 3GPP Band 1 (2100 MHz frequency band), the MCO uses integrated directional antennas to cost effectively extend W-CDMA coverage and high-speed packet access (HSPA) capacity to dense urban areas. The MCO is ideal for covering indoor hot spots such as restaurants, shops, hotels and offices from an outdoor location. Additionally, the MCO can also cover outdoor locations, such as city streets, with a significant range.



**Metro Cell Outdoor Front**



**Metro Dock Front**



**RF Box Back**

The Alcatel-Lucent 9764 MCO is easily deployed almost anywhere without the complexity or cost associated with traditional macro cell site installation. With its small dimensions and volume, the Alcatel-Lucent 9764 MCO may be mounted on a lamppost, pole or on the side of a building to deliver coverage and capacity directly to where it is needed. Network deployment and optimization costs of the Alcatel-Lucent 9764 MCO are also significantly reduced with Bell Labs Self-Organizing/Self-Optimizing Network (SON) technology that increases operational efficiency and network performance by automating configuration and network optimization.

Based on an innovative service modular design that separates out the mechanical, electrical and backhaul components into a metro dock and the RF components into an RF box that plugs into the metro dock, the Alcatel-Lucent 9764 Metro Cell Outdoor allows for greater deployment flexibility and easier frequency swaps and technology upgrades. With this design, the site may be prepared separately from the technology rollout. During site preparation, the metro dock is mounted on a pole, lamp post or the side of a building and connected to backhaul. Then, during rollout, the RF box is plugged into the

power connector, slid over the metro dock and locked. Alcatel-Lucent's innovative design simplifies later frequency swaps and technology upgrades. The MSP simply removes the RF box and replaces it with another RF box for the desired frequency or technology.

The MCO is the latest addition to the industry leading Alcatel-Lucent 9360 Small Cell solution. Field proven with many commercial deployments around the world, the 9360 Small Cell solution is a fully integrated carrier grade end-to-end solution that easily integrates into any operator's existing Third Generation (3G) network.

### FEATURES

- Small, lightweight unit that is virtually invisible when mounted a lamppost, pole, or wall
- Integrated fully digital directional antennas enabling higher throughput, lower interference and greater power efficiency
- Single W-CDMA carrier and sector
- Two path receive diversity
- Modular metro dock design supporting multiple backhaul options, including Gigabit Ethernet (GigE), Gigabit Passive Optical Network (GPON) and Wi-Fi®

- 3GPP Release 8 luh compliant
- Service segmentation enabling the operator to deploy the MCO only for a specific service type, such as HSPA data traffic
- SON capabilities
- Real-time operational status and service monitoring
- Handovers to and from macro network
- Small cell net capability to form autonomous self-organizing metro cell groups of extended coverage

## BENEFITS

- Easily deployable in optimal coverage locations with one person installation
- Provides high quality indoor coverage from an outdoor location as well as outdoor coverage
- Fast and reliable data connections and high data throughput
- Network deployment flexibility with easier frequency swaps and technology upgrades
- Extends W-CDMA coverage and high-speed downlink packet access (HSDPA)/high-speed uplink packet access (HSUPA) capacity to both outdoor and indoor locations with a low total cost of ownership (TCO)
- Enhanced performance and fault management for public, operator-owned small cells
- Seamless mobility with simultaneous voice and data service continuity within a metro cell group and with the macro network

## TECHNICAL SPECIFICATIONS

### Physical dimensions

- Height: 296 mm (11.6 in.)
- Width: 124 mm (4.9 in.)
- Depth: 118 mm (4.6 in.)
- Volume: 4.3 L (1.1 gal)

### Weight

- Approximately 3.5 kg (7.7 lb)

### Mount

- Lamppost, pole, or wall mountable
- Vertical orientation

### Power

- Supply
  - 110 V AC to 220 V AC
  - Consumption: 40 W

### Interfaces

- GigE over Small Form Factor Pluggable (SFP) electrical or optical
- GPON
- Wi-Fi (post trial version)

### Certifications

- CE

### Compliance

- RoHS
- WEEE

### Temperature range

- -40°C (-40°F) to +55°C (+131°F) (with solar shield)

### Radio characteristics

- Operating band: 3GPP band 1 (2100 MHz)
- Maximum transmission power: 38 dBm (6W) effective isotropic irradiated power (EIRP)
- Directional antenna with 8dBi gain, 70° vertical and 75° horizontal half power beam width
- 2 path receive diversity (cross polarized antennas)
- Baseband capacity
  - 16 devices with each device supporting a simultaneous voice and data session
  - 32 devices with each device supporting a simultaneous voice and data session (post trial version)
- Maximum bearers
  - 14.4 Mb/s L1 HSDPA bearer
  - 5.7 Mb/s L1 HSUPA bearer
- Receive sensitivity: -111 dBm at antenna port connector, 8dBi antenna gain

# ALCATEL-LUCENT 9364 METRO CELL OUTDOOR V2

1900/850 MHZ | RELEASE BCR 3.0

The Alcatel-Lucent 9364 Metro Cell Outdoor (MC OD) V2 is a low power, high capacity device that cost-effectively extends Wideband Code Division Multiple Access (W-CDMA) coverage and high-speed packet access (HSPA) capacity to public outdoor places, delivering fast, responsive data service and crystal-clear voice. It is well suited for providing dedicated coverage in high-use hotspots such as train stations, bus stops, and busy outdoor shopping and entertainment centers, for extending coverage to remote rural locations, and for filling in coverage holes within the larger macro network.



Front



Back



Bottom with cover removed

The Alcatel-Lucent 9364 MC OD is a rapidly installed device that is easily deployed without the complexity associated with macro cell site installation, and with its unique capability to form autonomous self-organizing groups, it makes covering large areas as easy as covering smaller ones. With the Alcatel-Lucent 9364 MC OD application enablement application programming interfaces (APIs), mobile service providers can leverage unique network capabilities, such as location and presence, for the creation of revenue-generating, public localized services.

The Alcatel-Lucent 9364 MC OD uses a flat IP architecture and secured access over an Ethernet connection to substantially reduce Capital Expenditures (CAPEX) and Operating Expenditures (OPEX), while simultaneously offloading voice and data traffic from the macro network. True plug-and-play capabilities and Bell Lab's Self-Organizing/Self Optimizing Network (SON) technology ensure zero-touch configuration and self-optimization to deliver outstanding performance with reduced operational expenses. The Alcatel-Lucent 9364 MC OD is part of the carrier-grade, end-to-end Alcatel-Lucent 9360 Small Cell solution that easily integrates into any operator's existing Third Generation (3G) network.

## FEATURES

- Small, lightweight unit, designed to withstand extreme outdoor conditions, that is mountable on a pole or wall
- High capacity, supports up to 32 users
- Extended coverage with a maximum transmit power of 250 mW
- Supports cell range of up to 2 km (1.2 miles) and metro cell users traveling at speeds up to 120 km (75 miles)/hr
- Service segmentation enabling the operator to deploy Metro Cell Outdoor access points only for a specific service type, such as HSPA data traffic
- Enhanced Quality of Service (QoS) with two external antennas for Rx space diversity
- SON capabilities
- Accurate location-based information with global positioning system (GPS) receiver, external GPS antenna and capability to request GPS assistance data from an external server
- GPS-based location lock that prevents the Small Cell access point from transmitting if it is not within a specific range of the provisioned location
- Secure, tamper-resistant outer casing with tamper alarm

- Supports shared secret and certificate-based authentication
- Real-time operational status and service monitoring
- Handovers to and from the macro network
- Small Cell net capability to form autonomous self-organizing groups of extended coverage
- Applications enablement with presence API, network local routing, and internet traffic breakout

## BENEFITS

- Easily deployed almost anywhere without the complexity associated with macro cell site installation
- Network deployment flexibility – ideal for both urban and rural coverage
- Fast and reliable data connections and high data throughput
- Extends W-CDMA coverage and HSDPA/ high-speed uplink packet access (HSUPA) capacity to public outdoor locations with a low total cost of ownership (TCO)
- Supports emergency calling and other location-associated services with accurate location-based information
- Provides secure access to the MSP's network
- Enhanced performance and fault management for public, operator-owned small cells
- Seamless mobility with simultaneous voice and data service continuity within metro cell group and with the macro network
- Enables the development of value-added, innovative services based on location, presence, QoS, and trusted security

## TECHNICAL SPECIFICATIONS

### Dimensions (HxWxD)

- 241x241x53 mm
- 9.48x9.48x2.08 in

### Weight

- <2 kg
- <4.4 lb

### Mount

- Pole or wall mountable
- Vertical position

### Power

- Supply: Power over Ethernet (PoE+)
- Supply option: External PoE+ injector
- Consumption:
  - Typical: 20 W
  - Maximum: 25 W

### Interface

- Transmission and PoE+: 10/100Base T RJ45

### Certification

- UL
- FCC

### Operating Temperature

- -33°C to +45°C (+55°C with optional sun shield)
- -27.4°F to +113°F (+131°F with optional sun shield)

### Electromagnetic Compatibility (EMC)

- FCC part 15 Class B
- OET-65
- TS 25.113 Rel 8

### Safety

- UL60950-1
- UL60950-22
- UL 1310
- UL 758
- CAN/CSA-C22.2 No. 950-95

### Radio Characteristics

- Operating band: 1900/850 MHz
- Listening bands:
  - 1900/850 MHz UMTS
  - 1900/850 MHz GSM sniffing bands
- Baseband capacity: Up to 32 devices with each connection supporting a simultaneous voice call and data session
- Maximum bearers:
  - 14.4 Mb/s L1 HSDPA bearer
  - 21 Mb/s L1 HSDPA bearer with optional 64 QAM for HSDPA feature
  - 5.7 Mb/s L1 HSUPA bearer
- Transmission power
  - Minimum: 0.016 mW
  - Maximum: 250 mW
  - Step: 1 dB
- Sensitivity: -107 dBm

# ALCATEL-LUCENT 9361 HOME CELL V2

2100 MHZ VARIANT

Release BCR 2.4.1 and BCR 3.0

The Alcatel-Lucent 9361 Home Cell (HC) version 2 is a low power, high capacity wireless device that cost effectively extends Wideband Code Division Multiple Access (W-CDMA) and high-speed packet access (HSPA) coverage and capacity to the home, delivering fast, responsive data service, and crystal clear voice. The end user simply connects the 9361 HC to power and a broadband Internet service, and the 9361 HC automatically comes into service without any additional user intervention. The 9361 HC not only increases the uptake of 3G services, generating additional revenue from services mobile service providers (MSPs) already offer, but also provides application programming interfaces (APIs) that enable MSPs to leverage unique network capabilities, such as location and presence, to develop new, innovative applications.



## PRODUCT OVERVIEW

The Alcatel-Lucent 9361 HC uses a flat IP architecture and secured access through an existing broadband Internet connection to offload voice and data traffic from a macro network, and substantially reduce capital expenditures (CAPEX) and operating expenditures (OPEX). True plug-and-play capabilities and Bell Labs Self organizing/ Self-optimizing Network (SON) technology enable zero-touch configuration and self-optimization to deliver outstanding performance. The Alcatel-Lucent 9361 HC is part of the carrier-grade, end-to-end Alcatel-Lucent 9360 Small Cells solution that easily integrates into any MSP's existing 3G network.

## FEATURES

- SON self-configuring and self-optimizing capabilities:
  - Adaptive transmit power for coverage optimization
  - 2G/3G neighbor lists for cell reselection and handovers
  - Selection of optimal primary scrambling code
- Provides seamless mobility and simultaneous voice and data service continuity with macro network
- Secure, tamper-resistant outer casing
- Supports shared secret and certificate based-authentication

- Support for open, prioritized open and closed access modes
- Application enablement with presence API, network local routing, and Internet traffic breakout
- Customizable per MSP's specification (strip color, logo, packaging sleeve, and user guide)

## BENEFITS

- Extends W-CDMA coverage and HSPA capacity to residences with a low total cost of ownership (TCO)
- Improves end-user quality of experience (QoE) with a higher quality air interface that provides crystal clear voice, faster and more reliable data connections, and higher data throughput
- Enables end-user self-installation with plug-and-play
- Eliminates special backhaul requirements by using an existing broadband Internet connection
- Provides secure access to the MSP's network
- Enables the development of value-added, innovative services based on location, presence, quality of service (QoS), and trusted security

## TECHNICAL SPECIFICATIONS

### Physical dimensions

- Height: 132 mm (5.2 in.)
- Width: 150 mm (5.9 in.)
- Depth: 33.5 mm (1.3 in.)
- Weight (without power supply): (< 300 g (< .66 lb)

### Mount

- Free standing or wall mountable
- Vertical orientation

### Power

- Supply:
  - External AC/DC adaptor - 220 V AC to 12 V DC
- Consumption:
  - Maximum: < 9 W

### Interface

- Transmission:
  - 10/100Base-T RJ-45
- Local connection:
  - 10/100Base-T RJ-45

### Certification

- CE

### Compliance

- RoHS
- WEEE

### Temperature range

- -5°C to +45°C (23°F to 113°F)

### Safety

- EN 60950-1
- EN 50383
- EN 50385
- 1999/519/EC

### Electromagnetic compatibility (EMC)

- EN 301 489-1
- EN 301 489-23
- EN 301 908-1
- EN 301 908-3

### Radio characteristics

- Variant A:
  - Operating band: 2100 MHz
  - Listening bands:
    - 2100 MHz and 900 MHz UMTS
    - 1800 MHz and 900 MHz Global System for Mobile communications (GSM)
- Variant B: (BCR 3.0)
  - Operating band: 2100 MHz
  - Listening bands:
    - 2100 MHz and 850 MHz UMTS
    - 1900 MHz and 850 MHz GSM
- Baseband capacity: Four devices with each connection supporting a simultaneous voice call and data session
- Maximum bearers:
  - 14.4 Mb/s L1 High-speed Downlink Packet Access (HSDPA) bearer
  - 21 Mb/s L1 HSDPA bearer - 64 QAM (BCR 3.0)
  - 5.7 Mb/s L1 High-speed Uplink Packet Access (HSUPA) bearer
- Maximum transmission power: 20 mW output power
- Sensitivity:
  - -113 dBm



# ALCATEL-LUCENT 9362 ENTERPRISE CELL V2.2 2100 MHZ RELEASE BCR 3.0 AND BCR 2.4.1

The Alcatel-Lucent 9362 Enterprise Cell (EC) V2.2 cost-effectively extends Wideband Code Division Multiple Access (W-CDMA) coverage and high-speed packet access (HSPA) capacity to businesses, delivering fast, responsive data service and crystal-clear voice. With scalable capacity, the Alcatel-Lucent 9362 EC is just the right size for enterprises, whether they have 16, 24 or 32 users. Additionally, the Alcatel-Lucent 9362 EC has a unique capability to form autonomous self-organizing groups of coverage, so medium to large enterprises, requiring many access points, are as easy to cover as offices needing only a single 9362 Enterprise Cell.



Front



Back

The Alcatel-Lucent 9362 EC is well-suited for filling holes in coverage within buildings, providing coverage for high-use hotspots such as lobbies, cafeterias and conference rooms, or for wholly blanketing an enterprise with superior Third-Generation (3G) coverage. With Alcatel-Lucent 9362 EC application enablement application programming interfaces (APIs), mobile service providers (MSPs) also have the flexibility to create new innovative services targeted at business users, building sustainable revenue opportunities for years to come.

The Alcatel-Lucent 9362 EC uses a flat IP architecture and secured access over an Ethernet connection to substantially reduce capital expenditures (CAPEX) and operating expense (OPEX), while simultaneously offloading voice and data traffic from the macro network. True plug-and-play capabilities and Bell Lab's Self-Organizing/Self Optimizing Network (SON) technology ensure zero-touch configuration for individual ECs and only light radio planning for groups of enterprise cells. SON also enables enterprise cells to self-optimize to deliver outstanding performance with reduced operational expenses. The Alcatel-Lucent 9362 EC is part of the carrier-grade, end-to-end Alcatel-Lucent 9360 Small Cell solution that easily integrates into any operator's existing 3G network. The Alcatel-Lucent 9362 EC is part of the carrier-grade,

end-to-end Alcatel-Lucent 9360 Small Cell solution that easily integrates into any operator's existing 3G network.

## FEATURES

- Small, lightweight device that may be installed in a free-standing position or mounted on a wall or ceiling
- Flexible coverage, supporting a maximum transmit power of 100 mW or 250 mW
- Scalable capacity, which supports 16 users with options to upgrade to 24 and 32 users
- Comes with Two integrated omnidirectional antennas
- Receive (Rx) space diversity for improved signal quality and greater capacity
- 64 QAM for higher throughput
- SON capabilities
- Secure outer casing - forced opening may optionally disable the unit permanently
- Support for shared secret and certificate-based authentication
- Access control with support for open, prioritized open, and closed modes
- Small cell net capability to form autonomous self-organizing groups of extended coverage
- Handovers to and from the macro network
- Applications enablement with presence API, network local routing and Internet traffic breakout
- Complete status reporting with user enabled/disabled bi-color LEDs

## BENEFITS

- Easily deployable anywhere within any size enterprise
- Grows with the enterprise, with pay-as-you-grow capacity
- Fast and reliable data connections and high data throughput
- Offers extended W-CDMA coverage and high-speed downlink packet access (HSDPA)/high-speed uplink packet access (HSUPA) capacity to the enterprise with a low total cost of ownership (TCO)
- Provides secure access to MSP's network
- Offers deployment flexibility – may be deployed individually or in groups that autonomously self-organize into a meshed network providing coverage for any size enterprise
- Provides seamless mobility and simultaneous voice and data service continuity with the macro network, as well as with other small cells within an enterprise group
- Enables the development of value-added, innovative services based on location, presence, QoS and trusted security

## TECHNICAL SPECIFICATIONS

### Dimensions (H x W x D)

- 252 x 166 x 44 mm
- 9.9 x 6.5 x 1.7 in

### Volume

- 1.84 liters
- 1.94 quarts

### Weight

- <1 kg
- <2.2 lb

### Mount

- Free standing, wall mountable or ceiling mountable

## Power

- Supply
  - Power over Ethernet (PoE+)
  - 12 V DC
- Supply options
  - External AC/DC adaptor – 110/240 V AC to 12 V DC
  - External PoE+ capable router (not supplied) or power injector (optional)
- Consumption
  - 100 mW option: < 20 W max
  - 250 mW option: 20 W max

## Protocols and interfaces

- Radio Access Network Application Protocol (RANAP) on Iuh
- RANAP on Iu Prime
- Transmission and PoE+: Gigabit Ethernet (GigE) connection (1000Base-T RJ45 connector)
- Local GigE connection to any other device: 1000Base-T RJ45

## Certification

- CE

## Compliance

- RoHS
- WEEE
- Basic requirements of Directive R&TTE 1999/5/EC on telecommunications terminal equipment, pertaining to electromagnetic interference, safety and health

## Operating temperature

- -5°C to +45°C
- 23°F to 113°F

## Operating relative humidity

- 5% to 95%

## Electrical safety

- EN 60950-1

## Health safety

- 1999/519/ec including EN 50383 and EN 50385

## Electromagnetic compatibility (EMC)

- EN 301 489-1
- EN 301 489-23
- EN 301 908-1
- EN 301 908-3
- EMC Directive 2004/108/EC
- EN-55022 Class B/CISPR22 Class B
- EN-55024/CISPR 24
- 3GPP TS 25.113

## Radio characteristics

- Operating band: 2100 MHz
- Listening bands
  - 2100 MHz UMTS
  - 900/1800 MHz GSM
- Rx diversity
- Capacity
  - 16 active users
  - Option to increase capacity in steps of 8 users, up to a maximum of 32 active users, with the purchase of additional licensing keys (with SW release BCR 3.0)
- Maximum bearers
  - BCR 2.4.1
    - 14.4 Mb/s HSDPA
    - 2 Mb/s HSUPA
  - BCR 3.0
    - 21 Mb/s HSDPA (with 64 QAM optional feature)
    - 5.7 Mb/s HSUPA
- Maximum transmission power
  - BCR 2.4.1
    - Two orderable versions: 100 mW or 250 mW
  - BCR 3.0
    - 100 mW
    - Option to increase transmission power to 250 mW with the purchase of additional licensing key
- Sensitivity: -107 dBm

# ALCATEL-LUCENT LIGHTRADIO 9768 METRO RADIO OUTDOOR V1.0 B38 TD-LTE 2X5W

The Alcatel-Lucent lightRadio™ 9768 Metro Radio Outdoor (MRO) V1.0 B38 TD-LTE 2x5W is a next-generation radio based on the Alcatel-Lucent ground-breaking lightRadio cube technology, which brings together the latest innovations in antennas, amplifiers and transceivers to minimize size and improve RF performance. Operating in the B38 frequency band (2575 MHz to 2615 MHz), the 9768 MRO TD-LTE B38 2x5W uses two integrated directional antennas to cost-effectively extend TD-LTE coverage and capacity in dense urban areas. The 9768 MRO TD-LTE B38 2x5W is ideal for covering high-rise buildings from outdoor locations and is small enough to be mounted on the side of a building, on a lamppost, on a pole or under a rooftop.



**9768 MRO  
front view**



**9768 MRO bottom view**

The Alcatel-Lucent 9768 lightRadio MRO TD-LTE B38 2x5W is easily deployed almost anywhere without the complexity or cost associated with traditional macro cell site installation. With its small dimensions and volume, the 9768 lightRadio MRO TD-LTE B38 2x5W may be mounted on a lamppost, on a pole, on the side of a building or under a rooftop to deliver coverage and capacity directly to where they are needed.

Additionally, MRO TD-LTE Network Optimization and Deployment cost benefits from self-organizing network (SON) features, which were developed for the Macro Network, increase operational efficiency and network performance by automating network configuration and optimization.

Based on the Alcatel-Lucent modular metro cell family concept, the 9768 lightRadio MRO TD-LTE B38 2x5W consists of the MRO Module and Metro Dock with a Common Public Radio Interference (CPRI™) fronthaul toward the macro baseband unit (BBU).

## FEATURES

- Small, lightweight unit that is virtually invisible
- Two configurations of integrated directional antennas provide different coverage scenarios: 1) 70° vertical aperture and 2) 35° vertical aperture
- High transmit power: 5 W conducted output power (37 dBm) at each transmit antenna port. It supports the full capacity of the Alcatel-Lucent 9926 Digital 2U NodeB (d2U) and is compatible with future baseband products.
- Supports bandwidth of 20 MHz
- Peak spectral efficiency capability at 20 MHz (HW capability):
  - 7.5 b/s/Hz DL L1
  - 3.7 b/s/Hz UL L1
- Two-path receive diversity with 2x2 MIMO enabled by cross-polarization
- Modular integrated Metro Dock design supports CPRI allowing daisy chaining
- Compliant with 3GPP Releases 8 and 9
- Macro BBU features enable handover to and from macro network, SON features, real-time operational status and service monitoring

## BENEFITS

- High-quality in-building coverage from an outdoor location
- Network deployment flexibility with two standard antenna configurations
- Easily deployed with one-person installation
- Fast and reliable data connections and high data throughput, even deep indoors
- TD-LTE macro coverage and capacity extended to hotspots with a low total cost of ownership (TCO)
- The two configurations of integrated directional antennas improve indoor coverage performance; the antennas offer higher throughput, lower interferences, and greater power efficiencies.
- Seamless metro-to-macro and macro-to-metro mobility with simultaneous voice and data service continuity
- Software upgradeable to support additional features in the future, such as LTE-A HetNet

## TECHNICAL SPECIFICATIONS

### Physical dimensions

- Height: 50.17 cm (19.75 in)
- Width: 16.93 cm (6.67 in)
- Depth: 15.89 cm (6.25 in)

### Weight

- Approximately 8 kg (17.63 lb) without Metro Dock

### Mount

- Lamppost, pole or wall mountable
- Vertical orientation

### Power supply

- Requires 220 V power feed (140 V/300 V nominal AC power input, 45 Hz or 65 Hz) and -38 V to -57 V power feed (DC input)
- Consumption: 80 W max

## Interfaces

- Small Form-Factor Pluggable (SFP) electrical or optical
- Blind mate connector between MRO Module and Metro Dock
  - Supports two optical SFP CPRI connections: one slave running at CPRI rate 5 and one master connecting MRO to MRO in daisy chain mode (support for future releases)
- One multi-colored LED that indicates status
- AC or DC power in: Power connector on the MRO Module to the MRO Dock
- Timing interfaces: Derives timing from CPRI interface and maintains a frequency accuracy of +/-50 ppb and a time accuracy of +/-1.5  $\mu$ s for the block d2U+MRO

## Certification

- CE

## Compliance

- Chinese RoHS
- IP65 as specified by IEC 529
- IEC 60068-2-52
- IEC 60721-3-4
- IEC 60721-3-2
- IEC 60721-3-1
- Chinese Earthquake Requirements in YD 5083-2005
- GB 4943-2008

## Temperature range

- -40°C (-40°F) to +50°C (+122°F)

## EMC compatibility

- GB-19286
- YDB 086-2-2012  
EN 55022 / CISPR22: 1998, class B, 3GPP TS 36.113 V8.2.0 (2008-12); ETSI EN 300 386 V1.3.1 (2001-09)
- The lightning protection performance of the MRO is tested using 8/20  $\mu$ s impact current test waveform with:
  - Power supply port at: >20 kA – 5 repetitions at each polarity
  - RF ports at: >5 kA – 5 repetitions at each polarity
  - Any other ports at: >3 kA – 5 repetitions at each polarity

## Radio characteristics

- Supports 3GPP frequency band 38 (2575 MHz to 2615 MHz) TD-LTE
- Integrated dual polarized Tx/Rx panel antenna
- Supports two different types of antenna with the following properties:
  - Configuration 1:
    - Antenna polarization is +/-45° slant
    - Typical antenna gain is min 7 dBi
  - Configuration 2:
    - Antenna polarization is +/-45° slant
    - Typical antenna gain is 10 dBi