Cisco Universal Small Cell 8438

The Cisco® Universal Small Cell 8438 (USC 8438) is part of the Cisco Universal Small Cell Solution, an end-to-end platform that integrates 3G, LTE, and carrier-grade Wi-Fi with self-organizing network (SON) and backhaul technologies for an efficient and highly secure heterogeneous network (HetNet). The Cisco USC platform provides the right solution for every indoor environment, from the home to enterprises of every size, up to large high-density environments such as airports, shopping malls, and campuses (Figure 1). The USC 8438 is designed to operate in conjunction with the Cisco USC 8088 Controller, providing transparent, high-quality coverage in large enterprises, across campuses, and in large indoor public spaces where mobile voice and data are mission critical.

Figure 1. Cisco Universal Small Cell Series Portfolio

Product Overview

Studies have shown that LTE subscribers increase their mobile data usage by up to ten times more than 3G users, once they get accustomed to LTE's faster speeds for data-intensive mobile applications. As the demand for mobile broadband accelerates, mobile network operators need to efficiently use LTE technologies to meet the growing demand for high-speed data services, without creating new network complexity. To address growing LTE demand, the USC 8438 integrates multi-access small cells into the mobile network by supporting LTE operations with SON capabilities.

The USC 8438 is part of the Cisco USC 8000 Series, which offers mobile operators transparent and fully coordinated mobile coverage for environments where the macro network cannot do so cost effectively. The crucial element is a single, high-density, multitechnology controller for management and autoconfiguration of the in-building system. Each small cell can be installed easily on walls or ceilings, and its network connectivity and power are provided over existing Ethernet. The USC 8438 is convection cooled with a built-in antenna (Figure 2).

Figure 2. Cisco Universal Small Cell 8438

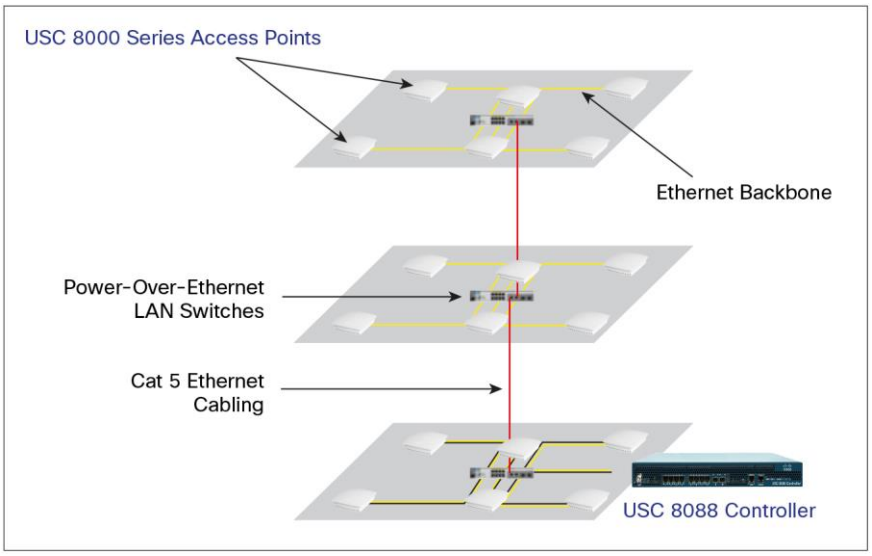
Cisco USC 8438 Features

The USC 8438 is a high-performance LTE small cell designed for scalable in-building deployments. It supports up to 32 active LTE users and 128 Radio Resource Control (RRC)-connected users. It also supports a peak downlink (DL) rate of 100 Mbps and a peak uplink (UL) rate of 50 Mbps, when used with 20-MHz channel bandwidth.

Each USC 8438 includes SON functionality to enhance transparent coordination among cells inside its environment, as well as 2G and 3G macrocells in multiple frequency bands. In addition, each access point performs continuous self-optimization to help provide high-quality radio coverage and mobility.

All communication between small cells and the USC 8088 Controller occurs through an IPSec tunnel to provide exceptional network security to the enterprise (Figure 3). Encryption keys and device certificates are stored using on-chip Trusted Platform Module (TPM) functions, allowing a highly secure boot process and certificate-based authentication. There is no management or console port on the USC 8000 Series platform, and physically, the unit can be locked to prevent theft or removal from the premises.

Figure 3. USC 8000 Series Architecture Overview



In summary, the USC 8438 offers the following features:

- 128 RRC-connected users
- 32 active users and 128 RRC-connected users
- 100 Mbps peak DL throughput and 50 Mbps peak UL throughput
- 2 x 2 multiple-input, multiple-output (MIMO)
- Multiple frequency-division duplexing (FDD) bands
- Internal antennas
- Deployable over existing Ethernet switching infrastructure (VLAN)
- Power-over-Ethernet (PoE)
- Wall and ceiling mountable, plenum-rated
- Certificate-based authentication with USC 8088 Controller

USC 8438 Benefits

The Cisco Universal Small Cell Solution is designed to address the challenge of mobile service coverage and to expand network capacity. Cisco small cell capabilities can be used to deploy consumer services that are based on indoor location and to support new enterprise services such as integration with enterprise voice systems and access to local enterprise networks. The USC 8000 Series provides these additional benefits to the solution:

- **Reduced network costs and operations:** By using existing infrastructure, structured cabling, and built-in automatic coordinated SON, the USC 8438 integrates with the controller architecture, making location selection, cabling, and deployment simple and cost effective.
- **Scalability:** Up to 100 USC 8438 small cells can be supported by a single controller to provide an enhanced user experience in large buildings.

- **Superior indoor signal strength and capacity:** The USC 8438 significantly increases signal strength throughout a building or site, promoting excellent voice quality and call clarity, as well as consistent connectivity with high-capacity call handling.
- **High data speeds for an enhanced multimedia experience:** By providing a tailored local base station, operators can support data throughput on mobile devices at speeds that outpace what is provided by the macro network in the poor signal conditions typically found indoors.

Product Specifications

Table 1 lists the product specifications for the USC 8438.

Table 1. Product Specification

Item	Specification
Enterprise installation	Mounting hardware included Padlock option Ceiling or wall mount Plenum-rated Power-over-Ethernet: 802.3at
LED indication	1 x tri-color LED, red, green, and blue (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 100/1000 Mbps Ethernet (RJ45) Operating temperature: ● 0 to 50oC (32 to 122o F) (vertically mounted) ● 0 to 40oC (32 to 104o F) (horizontally mounted) Storage temperature: 0 to 85oC Operating humidity: 0 to 90% noncondensing Storage humidity: 0 to 90% noncondensing Ingress protection rating: IP30
Security	Highly secure boot and key storage using TPM functions IPsec tunneling to services node X.509 certificate-based authentication [[see last row in Table 1]]
Timing and synchronization	IEEE 1588 based Precision Time Protocol Real-time synchronization to services node
Management	Single touch point for UMTS and LTE management Autoprovisioning

LTE Radio Specifications

Table 2 lists the LTE radio specifications for the USC 8438.

Table 2. LTE Radio Specification

Item	Specification
Performance	Peak rates: 100 Mbps DL, 50 Mbps UL (with 20 MHz) 32 active user 128 RRC-connected
Channel sizes	5 MHz 10 MHz 15 MHz 20 MHz

Item	Specification
Frequency bands	Available band class options ● LTE Band 4 (with UMTS 1900,850MHz and GSM 1900 and 850MHz monitor) ● LTE Band 7 (with UMTS 1900, 850MHz/2100MHz and GSM 1900, 900 and 850MHz monitor) ● LTE band 3 (with UMTS 2100 MHz, GSM 1800 and 900MHz)
Radio and antenna	2x2 MIMO Maximum transmit power: 2x125 mW (2x21 dBm) Two internal antennas Antenna gain: 2 dBi (Nominal)
Mobility	Inter-radio node handover anchored at services node Handover to and from macro (interfrequency, intrafrequency) Inter-RAT handover to and from UMTS
Voice services	VoLTE Circuit Switched Fall Back
QoS features	Support for LTE QCIs Multiple Data Radio Bearers (DRB) per user device Guaranteed Bit Rate (GBR) Maximum Bit Rate (MBR) Aggregate Maximum Bit Rate (AMBR)
RF management	LTE and UMTS network monitor Inter- and intrafrequency neighbor cell detection Autodetection of Physical Cell Identities (PCI) Automatic Neighbor Relation (ANR) management
Ciphering	SNOW 3G air interface encryption
Regulatory compliance	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 Industry Canada: RSS-133, RSS-139

Ordering Information

The USC 8438 is available for sale to service providers that have LTE technology and spectrum assets in the LTE Bands 3, 4, or 7. For detailed ordering information see Table 3 and Table 4.

Hardware

Table 3. Hardware Ordering Guide

Product Name	Description	Order Code
Universal Small Cell 8438, Band 3	LTE FDD small cell hardware. Supports 32 active LTE users, 2x2 MIMO with 125 mw per transmit antenna. Band Class 3	USC8438-T3-K9
Universal Small Cell 8438, Band 4	LTE FDD small cell hardware. Supports 32 active LTE users, 2x2 MIMO with 125 mw per transmit antenna. Band Class 4	USC8438-T4-K9
Universal Small Cell 8438, Band 7	LTE FDD small cell hardware. Supports 32 active LTE users, 2x2 MIMO with 125 mw per transmit antenna. Band Class 7	USC8438-T7-K9

Product Name	Description	Order Code
Universal Small Cell 8088 Controller	Controller hardware capable of supporting 100 LTE cells for a maximum of 100 small cells: ● up to 50 dual-mode or dual-carrier small cells, i.e. USC 8738, 8838 ● or up to 100 UMTS or LTE single-mode, i.e. USC 8338, USC 8438 ● or up to 100 dual-mode or dual-carrier switchable modules **Note:** USC 8088 is not upgradable to a higher capacity	USC8088-LC-K9
Universal Small Cell 8088 Controller (High Capacity)	Controller hardware capable of supporting 100 single mode or 100 dual-mode/dual-carrier cells for up to 100 small cells.	USC8088-HC-K9

Software

Table 4. Software Ordering Guide

Product Name	Description	Order Code
Small Cell Activation Software	Small cell activation license	USC8438-ASW-K9
Controller Software License	Controller capacity expansion software license for each small cell	USC8088-CSW-K9
Enterprise Management System License	Management software license for each small cell	USC8050-MSW-K9
Enterprise Management System Platform License	Enterprise management platform license. Licensed per server instance. Two platform licenses needed for redundant deployment	L-USC8050-PL-K9
Controller Activation Software	Activation software for controller	USC8088-LC-ASW-K9
High Capacity Controller Activation Software	Activation software for high capacity controller	USC8088-HC-ASW-K9

Warranty

The USC 8438 includes a 1-year limited hardware warranty and a 90-day software warranty, with 30-days return for repair. More detailed warranty information is available on Cisco.com at the Product Warranties page.

Cisco Small Cell Services

The Cisco Universal Small Cell Solution can be delivered by Cisco Services, an organization with exceptional experience and expertise implementing large commercial small cell deployments and providing world-class systems service integration. With specialized tools, knowledge, methodologies, best practices, and a collaborative delivery model that combines Cisco expertise with our partners' and customers' capabilities, Cisco Services promotes superior results. We help service providers mitigate risk, accelerate time to market for new revenue-generating services, lower total cost of ownership, increase the value of investments, and improve the customer experience through service assurance.

The Cisco Services team delivers comprehensive support, encompassing the service provider's entire network lifecycle. Through a lifecycle approach to services, Cisco has developed consistent and proven methodologies to help service providers successfully design and deliver new service offerings. These services are customized to operator needs and are delivered through an extensive global support infrastructure, which includes the award-winning Cisco Technical Assistance Center (TAC), Cisco Services resources, Centers of Excellence, small cell interoperability testing (IOT) and system verification (SVT) labs, and ecosystem partners.

Cisco Capital

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For More Information

For more information about the Cisco USC 8438, visit http://www.cisco.com/go/smallcell or contact your local account representative.

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