

## Cisco Universal Small Cell 8088 Controller



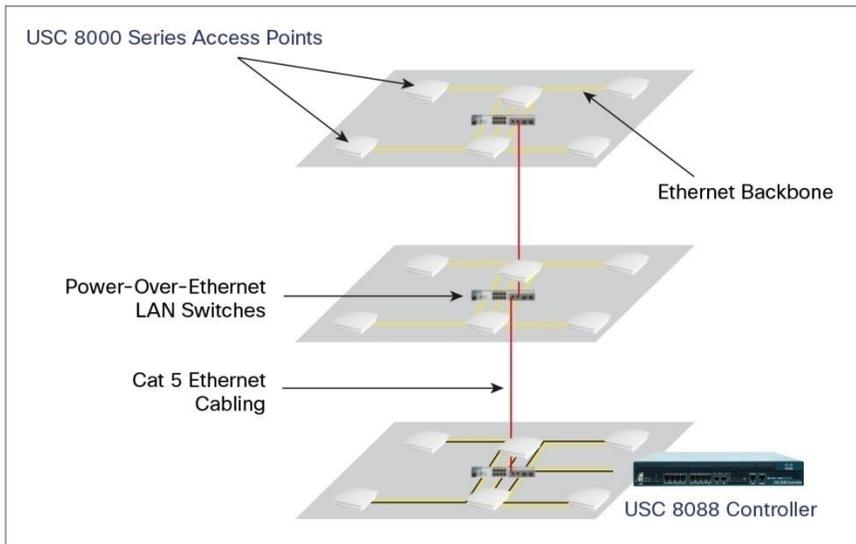
The Cisco® Universal Small Cell 8088 Controller (USC 8088 Controller) is part of the Cisco Universal Small Cell Solution, an end-to-end platform that integrates 3G, LTE, and carrier-grade Wi-Fi with self-organizing network (SON) and backhaul technologies for an efficient and highly secure heterogeneous network (HetNet). The Cisco USC Series 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. The USC 8088 Controller is designed to operate and work in conjunction with small cells in the Cisco USC 8000 Series. It helps provide transparent, high-quality coverage in a variety of architectures. This includes large enterprises, campuses, large indoor public spaces and across multiple enterprises, where mobile voice and data are mission critical.

### Product Overview

Small cell networks deployed in a business environment need to be integrated with the existing IT infrastructure. Challenges include providing simple, transparent, and contiguous coverage over a large, multifloor area as well as establishing simple and low-cost backhaul. The USC 8000 Series solves these problems using enhanced network integration technologies, along with soft handover, automatic configuration, and coordinated SON, within the entire coverage area.

The USC 8000 Series architecture offers transparent, fully coordinated coverage for large indoor environments by using a single, high-density, multitechnology controller for management and autoconfiguration of the in-building system - the Cisco USC 8088 Controller. It can control and manage up to 100 small cells, powered over Ethernet, to provide coverage and capacity for over 500,000 square feet of building space. Using this single controller, operators can mix many small cell types and deploy targeted coverage for 3G and LTE to large enterprises within days. This architecture dramatically simplifies configuration, RF management, intracell mobility, and traffic aggregation (Figure 1).

**Figure 1.** USC 8000 Series Architecture Overview



Each USC 8088 Controller includes SON capabilities to reduce interference, and it supports transparent handovers between small cells. The enterprise-optimized design provides the same ease of installation as that of traditional Wi-Fi equipment, and it greatly reduces the time to deploy new small cell sites. Operators can manage multiple access networks using a common backhaul connection over any Ethernet LAN and integrated network management system. No new cabling is required.

The USC 8088 Controller supports multimode small cells inside a single, integrated, enterprise premises-based appliance (Figure 2). As an optional capability, the controller includes a powerful application-hosting platform. These applications use an API to access the data, signaling, and local intelligence embedded in the wireless network. The controller can subsequently be used to support new applications and managed services across all wireless interfaces.

**Figure 2.** Cisco USC 8088 Controller



Using the powerful and flexible USC 8000 Series, reliable coverage and capacity within an enterprise, coupled with a desire to support new applications, can be provided.

### USC 8088 Controller Benefits

The Cisco Universal Small Cell Solution is designed to address the challenge of poor in-building cellular coverage while expanding network capacity. Cisco small cell capabilities can be used to deploy new services that are based on indoor location such as integration with enterprise voice systems and access to local enterprise networks. The USC 8088 Controller also provides the following additional benefits:

- **Reduced operational costs:** By using existing infrastructure, structured cabling, and built-in automatic, coordinated SON, the USC 8088 Controller makes location selection, cabling, and deployment simple and cost effective. The controller automatically coordinates and adjusts configuration in the event of changes, significantly reducing management and maintenance resource and cost.
- **Reduced capital expenditures:** Because all local management and coordination are provided in a single 1-rack-unit chassis, the CapEx costs associated with providing transparent high quality and contiguous coverage are reduced. The USC 8088 Controller also includes several enhanced features designed to simplify installation within an enterprise's network and to work with stringent IT requirements. These features include IPSec tunnel aggregation and VLAN management.
- **Multiple services:** The USC 8088 Controller supports 3G, LTE, and dual-mode (3G/4G in a single unit) USC 8000 Series small cells in a single chassis - reducing the management and coordination required to deploy and upgrade the network.
- **Scalability:** The USC 8088 Controller coordinates, manages, aggregates, and provides service for up to 100 small cells in a single chassis, promoting an enhanced user experience in large buildings. The Cisco USC 8088 High-Capacity Controller can further extend this capability to enhance service in the largest indoor environments. This higher-capacity controller can support up to 100 dual-band small cells (UMTS and LTE or dual-LTE).
- **On- or off-premises support:** Finally, a single USC 8088 Controller can be configured for off-premises ("centralized") operation while supporting multiple enterprises. This is a key step toward virtualization of the controller. With a single controller, enterprises can efficiently support multiple branch office locations while service providers now can economically serve smaller enterprise locations. Backhaul requirements for the Controller to be deployed centrally include:
  - **Packet Latency: 10ms**
  - **Jitter Tolerance: 3ms**
  - **Max Jitter: 15ms**
  - **Min Fronthaul Bandwidth: >5Mbps**

## Product Specifications

Table 1 provides the product specifications for the USC 8088 Controller.

**Table 1.** Product Specifications

Item	Specification
<b>Key features</b>	Simultaneous multiple air interfaces support 100 radio nodes Autodiscovery and provisioning of small cells SON for all air interfaces Backhaul network sharing and Quality of Service (QoS) Admission control and prioritization Coordinated radio environment monitoring (REM)
<b>UMTS</b>	2400 simultaneous sessions 1000 session setups per minute 250 Mbps aggregate 3G throughput Inter-small cell soft handover Autoassignment of primary scrambling codes Macro handover to UMTS and GSM (interfrequency and intrafrequency) Cell reselection from UMTS to LTE

Item	Specification
	CS macro hand-in from UMTS Access Overload Control Emergency call prioritization Cell broadcast (Commercial Mobile Alert System [CMAS]) Multioperator core network support luh, lu over IP (luCS and luPS) 3GPP Kasumi ciphering 3G Hand-in from R7 macro
<b>LTE</b>	8000 simultaneous sessions 2000 session-setups per minute 1-Gbps aggregate 4G throughput Intra-E-RAN Fast Handover Centrally coordinated dynamic fractional frequency reuse Handover to and from macro LTE Circuit Switched Fallback (CSFB) Voice over LTE (VoLTE) S1 (S1-C and S1-U) S1-Flex (connectivity to MME/SGW pools) SNOW 3G and AES encryption X2 Interface to Macro eNB LTE MOCN (both with/without HeNB GW) luh/S1 without IPSec HO over X2 and SRVCC
<b>Security</b>	TPM Highly secure boot and key storage Encrypted file system IPSec encryption X.509 certificate-based authentication (core network and small cells)
<b>Networking protocols</b>	Dynamic Host Configuration Protocol (DHCP) server and DHCP proxy IPv4, UDP, TCP, RTP, GTP, IPSec
<b>Timing and synchronization</b>	IEEE 1588 Precision Time Protocol (PTP)-based synchronization Multiple synchronization clock options <ul style="list-style-type: none"> <li>● Onboard high precision Oven Controlled Crystal Oscillator (OCXO)</li> <li>● Core network master Precision Time Protocol (PTP) server</li> <li>● Integrated Global Navigation Satellite System (GNSS) receiver (GPS or GLONASS)</li> </ul>
<b>Hardware features</b>	More than 300,000 hours overall system mean time between failures (MTBF) Component redundancy VLAN traffic separation
<b>Physical specification</b>	Interfaces <ul style="list-style-type: none"> <li>● 8 x Gbps Ethernet ports</li> <li>● 2 x Gbps SFP Ethernet ports</li> <li>● 1 x RJ45 Console Port (RS-232)</li> <li>● 1 x 10/100 management port</li> <li>● 1 x TNC Connector for GNSS antenna</li> </ul> Services Module: <ul style="list-style-type: none"> <li>● The Services Module is an additional edge compute platform embedded in the Enterprise Controller</li> <li>● Quad-core 2GHz Intel Xeon</li> <li>● 8Gb DDR3 RAM</li> <li>● 120Gb SSD flash storage, encrypted</li> <li>● Hosting for multiple KVMs in parallel</li> </ul> Mounting: 1RU (standard 19-inch rack) Dimensions: 603 x 448 x 44 mm (23.7 x 17.6 x 1.7 in) Weight: 10.7 kg (23.5 lb)  Electrical: <ul style="list-style-type: none"> <li>● Power: 150W</li> <li>● Voltage: 100 to 240V</li> <li>● Max Current: 4.5A</li> </ul>

Item	Specification
	Environmental: <ul style="list-style-type: none"> <li>• Altitude: 0 to 3000 meters (0 to 9843 ft)</li> <li>• Operating Temp: 0 to 40°C</li> <li>• Storage Temp: -40 to 70°C</li> <li>• Humidity: 7 to 93% noncondensing</li> <li>• Cooling: 5 x speed controlled, hot swappable fans</li> </ul> LEDs: <ul style="list-style-type: none"> <li>• 1 x power</li> <li>• 3 x status</li> <li>• 1 x synchronization</li> </ul>
<b>System management</b>	Configuration: remote management and autoconfiguration using TR-069 Faults and events: TR-069, SNMPv2c, SNMPv3, and Syslog Performance: 3GPP counters, KPIs, standard MIBs and SpiderCloud MIBs Command Line Interface (CLI) via console port and remotely using SSH
<b>Regulatory compliance</b>	CISPR 22:2008 Class A EN 55022:2010/AC:2011 EN 55024:2010 EN 61000-3-2:2006/A2:2009 EN 61000-3-3:2008 EN 60950-1:2006/A12:2011 VCCI V-3/2012.04 CAN/CSA-C22.2 NO. 60950-1A-07 (R2012)

## System Requirements

Table 2 provides the system requirements for the USC 8088 Controller.

**Table 2.** System Requirements

Component	Purpose
<b>Small cell gateway</b>	Cisco ASR 5000 or 5500-based HeNB-GW, or other Iuh standards-compliant gateway (subject to IOT) for 3G Services
<b>Small cell access points</b>	Cisco USC 8000 Series
<b>Enterprise management system</b>	Cisco USC 8050 EMS required for TR-069 provisioning and management of Cisco USC 8000 Series network

## Ordering Information

For detailed ordering information, see Table 3 and Table 4.

## Hardware

**Table 3.** Hardware Ordering Guide

Product Name	Description	Order Code
<b>Universal Small Cell 8088 Controller</b>	Controller Hardware capable of supporting up-to 50 dual-mode or dual-carrier USC8000 series small cells <b>Note:</b> USC8088 is not upgradable to a higher capacity.	USC8088-LC-K9
<b>Universal Small Cell 8088 Controller (High Capacity)</b>	Controller Hardware capable of supporting 100 dual-mode/dual-carrier USC8000 series small cells small cells.	USC8088-HC-K9

## Software

**Table 4.** Software Ordering Guide

Product Name	Description	Order Code
<b>Controller Software License</b>	Controller capacity expansion software license for each small cell	USC8088-CSW-K9
<b>Enterprise Management System License</b>	Management software license for each small cell	USC8050-MSW-K9
<b>Controller Activation Software</b>	Activation software for controller	USC8088-LC-ASW-K9
<b>High Capacity Controller Activation Software</b>	Activation software for high capacity controller	USC8088-HC-ASW-K9

## Warranty

The Cisco USC 8088 includes 1-year limited hardware warranty and 90 days software warranty, with a 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. Through a lifecycle approach to services, Cisco has developed consistent and proven methodologies to successfully design and deliver new service offerings. These services are customized and 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

### Financing to Help You Achieve Your Objectives

Cisco Capital<sup>®</sup> can help you acquire the technology you need to achieve your objectives and stay competitive. We can help you reduce CapEx. Accelerate your growth. Optimize your investment dollars and ROI. Cisco Capital financing gives you flexibility in acquiring hardware, software, services, and complementary third-party equipment. And there's just one predictable payment. Cisco Capital is available in more than 100 countries. [Learn more.](#)

## For More Information

For more information about the USC 8088 Controller, visit <http://www.cisco.com/go/smallcell> or contact your local account representative.



---

**Americas Headquarters**  
Cisco Systems, Inc.  
San Jose, CA

**Asia Pacific Headquarters**  
Cisco Systems (USA) Pte. Ltd.  
Singapore

**Europe Headquarters**  
Cisco Systems International BV Amsterdam,  
The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at [www.cisco.com/go/offices](http://www.cisco.com/go/offices).

 Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: [www.cisco.com/go/trademarks](http://www.cisco.com/go/trademarks). Third party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1110R)