SUNDRAY AP S650 Wireless Access Point

Product Overview

SUNDRAY AP S650 is a new-generation 802.11achigh-performance wireless access point developed by SUNDRAY. AP S650 is embedded with 3x3 MIMO high gain antenna. It supports dual frequencies of 802.11ac/a/n and 802.11b/g/n and the maximum transmission rate can reach up to 1750 Mbps. A higher wireless access rate and wider wireless coverage are provided. The maximum transmission rate of 1.75 Gbps can easily meet the bearer requirements of all types of wireless services such as video and voice multimedia services. Intelligent RF, QoS and seamless roaming are also provided.

AP S650 adopts the GE port for uplink and breaks the restriction of 100M uplink rate, ensuring high-speed wireless transmission. Build-in with i-beacon module, with a USB port Both local power supply and PoE remote power supply are supported. The power supply mode can be flexibly selected based on the actual environment. In cooperation with the SUNDRAY NAC series controllers, AP S650 brings unrivaled quick and secure access experience to users.

The SUNDRAY AP S650 series products adopt ceiling design, are aesthetically designed and can be conveniently installed. It can be mounted on the ceiling or wall, or placed on the desk.

SUNDRAY AP S650

Product Features

Top-speed wireless network access

- **802.11ac high-speed access**

  SUNDRAY AP S650 series products comply with the new-generation 802.11ac standard and are embedded

with an intelligent antenna matrix. The 2.4 GHz RF provides a transmission rate high up to 450 Mbps, the 5 GHz RF provides a transmission rate high up to 1300 Mbps, and the system transmission rate can reach 1750 Mbps, thereby providing high-performance wireless access services in terms of coverage scope, access density and operation stability.

- **GE uplink**

  A 10/100/1000Base-T Ethernet port is used as the uplink port and a GE port is used for uplink, breaking the restriction of traditional 100M transmission rate. The wired port is no longer the bottleneck of the wireless access rate.

- **QoS guarantee**

  SUNDRAY AP S650 supports different QoS levels. It supports air interface resource management based on applications, SSIDs or STAs to ensure that air interfaces are appropriately allocated and that the data of important SSIDs and applications is transmitted in preference. Transmission priorities can be defined for different service data through 802.11e/WMM. This ensures differentiated QoS levels.

- **Seamless roaming for L2 and L3**

  SUNDRAY AP S650 works with SUNDRAY wireless controller to implement seamless roaming for L2 and L3. When a wireless user roams, the IP address and authentication status remain unchanged. The terminal viscosity prevention function is provided to intelligently guide an STA to the optimal AP, increasing the roaming speed.

- **Terminal dragging prevention to ensure high-speed network access for all users on the entire network**

  Terminal dragging prevention involves enabling terminals with different negotiated rates to occupy the identical wireless channel time by using the time fairness algorithm. This avoids problems of low wireless access speed, high delay and low network performance caused by low access rates of some terminals.

- **Intelligent load balancing**

  In the case of high-density wireless users, SUNDRAY AP S650 works with SUNDRAY wireless controller to implement intelligent load balancing based on the user quantity, traffic, and frequency band for the purpose of improving the bandwidth usage, thereby ensuring high wireless access speed for users. Frequency band-based load balancing enables 2.4/5 GHz dual-frequency terminals to access the 5 GHz frequency band in preference.

- **Intelligent RF to reduce wireless interference in an all-round way**

  The work channel and transmit power of the wireless access point are adjusted automatically and interference from the surrounding environment is detected in real time to reduce radio interference in an all-round way and to improve the overall service quality of the wireless network.

All-round security protection

- **Multiple easy-to-use and secure authentication modes**

  Multiple flexible, easy-to-use and secure user authentication modes are available. 802.1x, portal, SMS, WeChat, and QR code authentication modes are provided with the support of SUNDRAY wireless controller to meet network deployment requirements in environments including enterprises, schools, shopping malls, hotels, and financial organizations.

- **AP VPN remote access**

  AP can build a VPN tunnel to the controller side, in this way the clients can access the resources in the HQ, at the same time, the internet access will go directly to the internet without being tunneled back. In small branches there is no need to deploy a VPN device, help to reduce the investment for the customer.

- **All-round wireless security protection**

With the support of SUNDRAY wireless controller, AP S650 provides a wide range of wireless security protection functions including WIDS/WIPS, illegitimate AP detection and workaround, ARP spoofing prevention, and DoS attack prevention, constructing a truly secure and reliable wireless network for users.

- **Timed turning off of RF for network security and environment protection**

  RF can be turned off and on based on time periods. The wireless network can be automatically turned off at nights and weekends to prevent malicious users from intruding the network and to reduce energy consumption of the equipment.

Flexible network deployment

- **Gateway function to implement remote deployment across the public network**

  SUNDRAY AP S650 supports the NAT gateway function and provides the functionality of the DHCP server and DNS proxy. When remotely deploying the wireless network for a branch or outlet, the PPPoE dial-up function provided by AP S650 can be used to directly access the Internet, lowering the network construction costs.

- **Thin and Fat mode**

  Based on the requirement, SUNDRAY AP S650 can easily change the working mode between thin AP and standalone AP. In the early stage of the network deployment, the AP can be used as standalone mode, with the development of the network, the AP can be changed to FAT mode to be managed by the controller.

- **WDS wireless relay/bridge**

  AP S650 supports WDS and wireless relays/bridges in point-to-point or point-to-multipoint mode to resolve deployment problems like deployment inconvenience. The WDS function is used to relay and amplify signals for the purpose of extending the wireless coverage scope. The Ethernet port of a wireless relay AP can be connected to a wired switch to extend the wireless coverage scope and wired LAN.

- **Local forwarding**

  With the local forwarding technology, AP S650 can directly forward data that features high real-time transmission requirements, delay sensitivity, and large amount over the wired network without passing the wireless controller. This alleviates the traffic load of the wireless controller significantly and breaks the traffic restrictions of the wireless controller.

- **Virtual AP technology**

  A maximum of 32 ESSIDs can be provided by using the virtual AP technology. Different SSIDs use different authentication modes and have different network access permission. The SSIDs are isolated from each other. L2 isolation can be implemented for terminals that use the same SSID on a subnet or VLAN to ensure user data security.

- **SSID**

  An SSID with a maximum of 32 characters can be specified. An SSID can also contain both Chinese and English characters. Individualized SSIDs are available for shopping malls or enterprises to improve discrimination.

Marketing

- **Access analysis**

  Build-in access analysis system, support report the device appear time, MAC address, and report the data differently in the first access and repeat access, passerby and total number coming and not coming in. Also will show the duration of stay. Based on the statistics, will have a better understanding of the clients in the network and offer information for the operators to make decision.

- **Marketing based on user behavior**

  Based on the client's behavior to make the policy of when to push the message. The policy support based on the application the client is using, and based on location, schedule, first access repeat access. The message support banner, SMS, wechat message and webpage.

- **APP and file cache**

  The controller and the USB drive on the AP can cache the application for ios and android devices. It will help to accelerate the network. Also it will help to accelerate the app authentication.

- **I-beacon marketing**

  AP-650 has already integrated with an i-beacon module. This will help the customer to promote their product and send some voucher to their customer

Technical Specifications

Hardware specifications

Product Specifications of SUNDRAY AP S650 Indoors	
Hardware specifications	
Item	Description
Model	AP S650
Weight	0.45Kg
Dimensions (excluding antenna interfaces and accessories)	196 x 196 x 45 mm
Ethernet port	2*10/100/1000 Mbps
PoE	802.3 at
USB	1*USB port
Local power supply	12 V/1.5A
Transmit power	WIFI：20dBm Bluetooth：Class 2
Power adjustment granularity	1 dBm
Power range	1 dBm to the value specified by national regulations
Power consumption	< 18 W
Antenna	Embedded 3*3mimo high gain antenna
Reset/restore factory settings	Supported
Status indicator	1*Status
Operating/storage temperature	-10 ℃ to 55 ℃ or -40 ℃ to 70 ℃
Operating/storage humidity	5%-95% (non-condensing)
Protection level	IP 41
MTBF	> 250000 H

Software specifications

Software specifications		
Item		Description
Model		AP S650
RF	Streams	3
	Maximum transmission speed of a single frequency	2.4 G：450 Mbps 5 G：1300 Mbps

Software specifications		
	Operating frequency band	802.11ac/n/a: 5.725-5.850 GHz, 5.15-5.35 GHz (China) 802.11b/g/n: 2.4-2.483GHz (China)
	Modulation technology	OFDM: BPSK@6/9 Mbps, QPSK@12/18 Mbps, 16-QAM@24 Mbps, 64-QAM@48/54 Mbps DSSS: DBPSK@1 Mbps, DQPSK@2 Mbps, CCK@5.5/11 Mbps MIMO-OFDM: MCS 0-15 MIMO-OFDM (11ac): MCS 0-9
	Channel rate	802.11b: 1, 2, 5.5, 11 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 802.11n: 6.5 to 300 (MCS0 to MCS15) 802.11n high throughput support: MCS 0-7 HT 20/40 802.11ac: MCS 0-9, 20/40/80
	Channel quantity	802.11a, 802.11n, 802.11ac (compatible with 802.11a): 5 channels 802.11b, 802.11g, 802.11n (compatible with 802.11b/g mode): 13 channels
	Manual and automatic channel adjustment	Supported
	Automatic power adjustment	Supported
	Manual power adjustment	The AP supports manual power adjustment with an adjustment granularity of 1 dBm. The power scope is from 1 dBm to the value specified by national regulations.
	Timed turning on or off of RF	RF can be turned on or off based on the specified time period.
	Coverage black hole detection and compensation	Supported
WLAN function	Maximum number of connected users	256 (maximum number of connected users of a single RF: 128)
	Connected user quantity restriction	Supported
	Virtual AP	32
	Chinese SSID	Supported
	SSID hiding	Supported
	Wireless relay/bridge	Point-to-point and point-to-multipoint supported
	User-, traffic-, and frequency band-based intelligent load balancing	Supported
	Bandwidth restriction	STA, SSID, or AP-based rate limiting is supported.
	STA function	Abnormal STA disconnection detection, STA aging detection, and STA statistic and status query are supported.
	Link integrity detection	Supported

Software specifications		
Security authentication	Authentication mode	Pre-shared key authentication, portal authentication, 802.1x authentication, CA certificate authentication, WeChat authentication, SMS authentication, QR code authentication, temporary visitor authentication, and authentication exemption are supported.
	Pre-shared key	WPA-PSK, WPA2-PSK, WPA-PSK/WPA2-PSK hybrid authentication
	Portal authentication	Intelligent terminal type identification is supported. A page matching the terminal size is pushed to terminals. The page logo and displayed information can be customized. In addition, the verification, authentication interval, and reconnection authentication time thresholds can be set.
	802.1x authentication	802.1x one-key configuration and 802.1x perception-free authentication are supported. You only need to download the one-key automatic configuration tool at initial access and finish wireless network configuration quickly. This simplified network deployment significantly.
	CA certificate authentication	High-security certificate authentication can be implemented by using the CA certificate issuance center embedded into the controller, without the need to constructing a certificate server. Authentication by using a certificate imported from an external certificate server is also supported.
	WeChat authentication	After access the wireless network, a user can scan the QR code of the shopping mall or enterprise and follow the public account to access the Internet. The one-key follow function can be easily deployed without any code development. In WeChat authentication, a user can access the network by clicking a text message network access link or clicking the menu bar to view advertisements, or access the network via WeChat authorization.
	SMS authentication	SMS authentication takes effect forever. That is, a user can directly access the network without authentication after being authenticated via SMS at initial access. This reduces the SMS costs and improves user experience.
	QR code authentication	After a visitor terminal accesses the wireless network, the terminal will automatically display a QR page. The approver scans the QR code of the visitor terminal via a cell phone and then the visitor can access the Internet. The visitor information is recorded in three dimensions: approver, remarks, and MAC address of the visitor terminal. This ensures user traceability and network security.
	MAC + portal authentication	The device in the MAC address list do not need authentication, the other device still need authentication

Software specifications		
	Temporary visitor authentication	A temporary user information management system is embedded. A temporary user can log in within the validity period and cannot after the validity period elapses. A secondary permission system for temporary account management is embedded and temporary accounts can be created and managed in this system. The QR code of a temporary visitor can be printed and the temporary visitor can scan the QR code to access the network. Temporary visitors can be grouped.
	Authentication exemption	Only a portal advertisement page is displayed. A user needs to click the login button to access the network without entering any account password or performing other authentication.
	Self- registration	Clients can register the account via portal, and Retrieve password via SMS
	Email binding	Support binding account with email, and Retrieve password via email
	Data encryption	Data encryption via TKIP and AES (CCMP) is supported.
	Blacklist and whitelist	Static whitelist and blacklist and dynamic blacklist are supported.
	User isolation	SSID-based isolation, automatic VLAN grouping, and user isolation of specified VLANs are supported.
	WIDS/WIPS	Supported
	Illegitimate AP detection and workaround	Supported
	ACL	Account-, access location-, access terminal type- and SSID-based ACL policy assignment and management are supported.
	Radius protocol	Supported
Wireless optimization	E-schoolbag scenario optimization	The transmission speed of multicast packets is increased, improving the effects of the E-schoolbag scenario in an all-round way.
	Intelligent broadcast acceleration	The transmission speed of broadcast packets is automatically increased based on the actual environment, thereby improving the transmission efficiency of broadcast packets.
	Terminal dragging prevention	This function aims to prevent the decrease of the entire network speed caused by low-speed terminals based on the time fairness algorithm.
	Terminal viscosity prevention	This function involves detecting STAs connected to APs and intelligently guiding the STAs to the optimal AP.
	Prohibited access of low-speed terminals	The speed of access terminals is limited. Weak-signal terminals with a speed lower than the specified value are prohibited from accessing the network. This improves the entire network speed.
	High-density access scenario optimization	The response to broadcast probe requests is controlled for the purpose of optimizing high-density access scenarios.
	ARP-unicast conversion	ARP broadcast packets are converted into unicast packets. This reduces the number of broadcast packets, thereby improving the transmission speed.

Software specifications		
	Prohibited DHCP requests destined for wireless terminals	After this function is enabled, DHCP broadcast requests will be forwarded only to the wired network, instead of other wireless network. This improves the network throughput and performance of the wireless network.
	AP-based access user quantity statistics	The number of connected users and change trends of each AP in the recent one day, one week, and one month can be measured.
Hotspot analysis	AP-based network access traffic statistics	The network access traffic and change trends of each AP in the recent one day, one week, and one month can be measured.
	AP-based signal quality analysis	Statistic analysis for the signal usage, noise, retransmit rate, BER, and BER change trends of each AP is supported.
	AC discovery mechanism	L2 broadcast automatic discovery L3 discovery based on configured static IP addresses DHCP Option43 discovery DNS domain name discovery
AP access mode	Cross-WAN and cross-NAT remote AP deployment	Supported
	webAgent	Controller IP addresses can be dynamically discovered by using the webAgent technology. This avoids AP disconnection caused by unfixed controller IP addresses.
	Tunnel encryption	Supported
	NAT	Supported
L3 function	Network access mode	PPPoE dial-up and static IP address
	DHCP server	Supported
	DNS proxy	Supported
	Relay mode	Point-to-point and point-to-multipoint supported
VPN	AP VPN	Build the VPN tunnel between the controller and AP, access the application in HQ via tunnel, but other traffic will go direct to the internet
Wireless relay/bridge	Relay frequency band	2.4/5.8 GHz
	Disable wireless network on relay frequency band	Supported
	Wireless backhaul service	Supported

Order Information

Model	Specifications	Remarks
SUNDRAY AP S650 series		
AP S650	AP S650 wireless access point is embedded with 3x3 MIMO high gain antenna and supports 802.11a/b/g/n/ac, dual frequencies of 2.4 GHz and 5 GHz, three streams, a maximum access rate of 1750 Mbps, GE uplink port, PoE power supply, and local power supply (the PoE injector and local power adapter need to be independently purchased).	Essential
Optional parts		
AP power supply	External power adapter: 12 V/1.5 A	Optional
SW-5008	8-port PoE switch that supports 802.3af/at	Optional
SW-5024	24-port PoE switch that supports 802.3af/at	Optional

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