



HUAWEI eKit

Huawei eKitEngine AP661 Access Point Datasheet



Triple-Radio Ultra-High-Speed AX6600 High-Density AP

Make SME Network Easier and Smarter



Product Overview

Huawei eKitEngine AP661 is an indoor AP in compliance with Wi-Fi 6 (802.11ax). It can simultaneously provide services on 2.4 GHz (2x2 MIMO), 5 GHz (2x2 MIMO) and 5 GHz (4x4 MIMO) frequency bands, achieving a device rate of up to 6.575 Gbps. Built-in smart antennas of the AP enable always-on Wi-Fi signals for users, significantly enhancing users' wireless experiences. These strengths make it ideal for densely populated scenarios such as mobile office, education, and stadiums.

- Built-in smart antennas that automatically adjust the coverage direction and signal strength based on the intelligent switchover algorithm to adapt to changes in the external environment, in addition to providing accurate and stable coverage as stations (STAs) move
- USB port for IoT expansion (such as ZigBee and RFID)
- Working modes: Fit, Fat, and cloud management

Feature Description

Wi-Fi 6 (802.11ax) standard

- As the latest Wi-Fi standard defined in IEEE 802.11, 802.11ax improves the user access capacity and bandwidth in high-density access scenarios, reduces service latency, and enhances user experience.
- Multi-user multiple-input multiple-output (MU-MIMO) on both the 2.4 GHz and 5 GHz frequency bands, allowing an AP to transmit data to and receive data from multiple STAs simultaneously and multiplying the utilization of radio spectrum resources.
- 802.11ax supports 1024-QAM, delivering 25% higher data transmission efficiency than 802.11ac (supporting 256-QAM).
- Orthogonal Frequency Division Multiple Access (OFDMA) technology enables the AP to transmit data to multiple STAs at the same time using different subcarriers, reducing latency and improving network efficiency.
- Spatial multiplexing technology uses basic service set (BSS) coloring mechanism to enable the AP and STAs to distinguish overlapping BSSs, minimizing co-channel interference.
- Target Wake Time (TWT) technology allows the AP and STAs to negotiate the sleep and wake time with each other, thereby improving the battery life of the STAs.

MU-MIMO

The AP supports MU-MIMO and supports a maximum of eight spatial streams, two spatial streams on the 2.4 GHz frequency band and six spatial streams on the 5 GHz band (two on the high-frequency band and four on the low-frequency band). The MU-MIMO technology enables an AP to send data to multiple STAs simultaneously, which doubles the radio spectrum resource usage, increases the number of access users and bandwidth, and improves user experience in high-density access scenarios.

Smart antenna

The dual-band smart antenna array technology and intelligent switchover algorithm enable the AP to intelligently sense the application environment and access density, achieving accurate Wi-Fi coverage and interference suppression. They together provide the optimal coverage direction and signal quality for each access STA, and offer seamless and smooth wireless network experience to users.

High-speed access

The AP supports 160 MHz frequency bandwidth, which increases the number of available data subcarriers and expands transmission channels. In addition, the AP adopts 1024-QAM and MU-MIMO to achieve a rate of up to 0.575 Gbps on the 2.4 GHz band and 6 Gbps on the 5 GHz band, meaning up to 6.575 Gbps for the device.

High Density Boost technology

Huawei uses the following technologies to address challenges in high-density scenarios, including access problems, data congestion, and poor roaming experience:

SmartRadio for air interface optimization

- Load balancing during smart roaming: The load balancing algorithm is used to perform load balancing detection on APs after STAs roam, and adjust the STA load on each AP accordingly to improve network stability.
- Intelligent DFA technology: The dynamic frequency assignment (DFA) algorithm is used to automatically detect adjacent-channel and co-channel interference, and identify any 2.4 GHz redundant radio. Through automatic inter-AP negotiation, the redundant radio is automatically switched to another mode or is disabled to reduce 2.4 GHz co-channel interference and increase the system capacity.
- Intelligent conflict optimization technology: The dynamic enhanced distributed channel access (EDCA) and airtime scheduling algorithms are used to schedule the channel occupation time and service priority of each STA. This ensures that each STA is assigned a relatively equal amount of time for using channel resources and user services are scheduled in an orderly manner, improving service processing efficiency and user experience.

Air interface performance optimization

- In high-density access scenarios, access of many low-rate STAs consumes many resources on the air interface, compromises the AP capacity, and degrades user experience. To address this issue, the AP checks the access rate of STAs and denies access of low-rate or weak-signal STAs. In addition, the AP monitors the rate and signal strength of online STAs in real time, and forcibly disconnects low-rate or weak-signal STAs and then steer such STAs to APs with stronger signals. This STA access control technology can increase air interface efficiency and allow access of more STAs.

5G-prior access

- The AP supports both 2.4 GHz and 5 GHz frequency bands. The 5G-prior access function enables the AP to steer STAs to the 5 GHz frequency band preferentially, which reduces loads and interference on the 2.4 GHz frequency band, improving user experience.

Wired and wireless security guarantee

To ensure data security, Huawei APs integrate wired and wireless security measures and provide comprehensive security protection.

Authentication and encryption for wireless access

- The AP supports WEP, WPA/WPA2-PSK, WPA3-SAE, WPA/WPA2-PPSK, WPA/WPA2/WPA3-802.1X, and WAPI authentication/encryption modes to ensure the security of wireless networks. The authentication mechanism is used to authenticate user identities so that only authorized users can access network resources. The encryption mechanism is used to encrypt data transmitted over wireless links to ensure that data can only be received and parsed by authorized users.

Analysis on non-Wi-Fi interference sources

- The AP can perform spectrum analysis to identify non-Wi-Fi interference sources, including baby monitors, Bluetooth devices, digital cordless phones (on the 2.4 GHz frequency band only), wireless audio transmitters (on

both the 2.4 GHz and 5 GHz frequency bands), wireless game controllers, and microwave ovens. Coupled with Huawei's NMS, the AP can accurately detect interference sources and display their spectrum, helping administrators eliminate the interference in a timely manner.

Rogue device monitoring

- The AP provides the wireless intrusion detection system (WIDS)/wireless intrusion prevention system (WIPS) attack detection mechanism to monitor, identify, defend against, contain, and perform refined management on rogue devices, providing security guarantees for air interface environment and wireless data transmission.

Authentication and encryption for wired access

- The AP access control mechanism ensures that only authorized users can access the AP. CAPWAP link protection as well as DTLS and IPsec encryption provide security guarantee and improve data transmission security between the AP and WAC.

Automatic radio calibration

Automatic radio calibration allows the AP to collect signal strength, channel, and other parameters of surrounding APs and generate an AP topology according to the collected data. Based on interference from other authorized APs, rogue APs, and non-Wi-Fi interference sources, and their loads, the AP automatically adjusts its transmit power and working channel to make the network operate at the optimal performance. In this way, network reliability and user experience are improved.

Automatic application identification

The AP uses smart application control technology to implement visualized management and control over Layer 4 to Layer 7 applications.

Traffic identification

- Coupled with a Huawei WAC, the AP can identify over 1500 common applications in various office scenarios. Based on the identification results, the AP can perform policy control on user services, including priority adjustment, scheduling, blocking, and rate limiting, to maximize bandwidth utilization and improve quality of key services.

Traffic statistics collection

- Traffic statistics of each application can be collected globally, by SSID, or by user. In this way, network administrators can gain insights into application use status on the network, and network administrators or operators can implement visualized control on service applications on smart terminals, enhancing security and ensuring efficient bandwidth control.

Leader AP

In small- and medium-sized enterprises (SMEs), one AP can be configured as the leader AP and function as the virtual WAC to manage other Fit APs. In addition, no AP management license needs to be purchased, which effectively reduces customer investment.

Cloud management

The AP supports cloud-based management. It provides various authentication functions, such as PSK, Portal, SMS, and social media authentication, without the need of a WAC or an authentication server. This greatly simplifies networking and reduces CAPEX. In addition, the AP can be deployed on a cloud management platform to implement cloud-based network planning, deployment, inspection, and O&M. In multi-branch deployment scenarios, after cloud APs are pre-configured on the cloud management platform, deployment personnel only need to power on the cloud APs on site,

connect them to network ports of switches, and scan their QR codes to achieve plug-and-play. Then the pre-configurations are automatically delivered to the APs. This greatly accelerates network deployment. The cloud management platform can monitor the network status, device status, and STA connection status at all sites of tenants in a comprehensive and intuitive manner.

Product Features

Fat/Fit AP mode

Item	Description
WLAN features	Compliance with IEEE 802.11ax and compatibility with IEEE 802.11a/b/g/n/ac/ac Wave 2 Maximum ratio combining (MRC) Space time block code (STBC) Cyclic delay diversity (CDD)/Cyclic shift diversity (CSD) Beamforming Multi-user multiple-input multiple-output (MU-MIMO) Orthogonal frequency division multiple access (OFDMA) Compliance with 1024-QAM and compatibility with 256-QAM/64-QAM/16-QAM/8-QAM/QPSK/BPSK Target wake time (TWT) Low-density parity-check (LDPC) Frame aggregation, including A-MPDU (Tx/Rx) and A-MSDU (Tx/Rx) 802.11 dynamic frequency selection (DFS) Short GI in 20 MHz, 40 MHz, 80 MHz, and 160 MHz modes Priority mapping and scheduling that are compliant with Wi-Fi multimedia (WMM) to implement priority-based data processing and forwarding; automatic and manual rate adjustment (the rate is adjusted automatically by default) WLAN channel management and channel rate adjustment NOTE For detailed management channels, see <i>Country Code & Channel Compliance Table</i>. Automatic channel scanning and interference avoidance Separate service set identifier (SSID) hiding configuration for each AP, supporting Chinese SSIDs Signal sustain technology (SST) Unscheduled automatic power save delivery (U-APSD) Control and provisioning of wireless access points (CAPWAP) in Fit AP mode Automatic login in Fit AP mode Extended service set (ESS) in Fit AP mode Advanced cellular coexistence (ACC), minimizing the impact of interference from cellular networks Multi-user CAC 802.11k and 802.11v smart roaming 802.11r fast roaming (≤ 50 ms)
Network features	Compliance with IEEE 802.3ab Auto-negotiation of the rate and duplex mode and automatic switchover between the

Item	Description
	Media Dependent Interface (MDI) and Media Dependent Interface Crossover (MDI-X) Compliance with IEEE 802.1Q VLAN assignment by SSID VLAN trunk on uplink Ethernet ports Management channel of the AP's uplink port in tagged or untagged mode DHCP client, obtaining IP addresses through DHCP Tunnel data forwarding and direct data forwarding Application identification and QoS classification on the AP in local forwarding (direct forwarding) mode for better voice quality (identifiable common applications in the industry: Skype, QQ, and WeChat) STA isolation in the same VLAN IPv4/IPv6 access control list (ACL) Link layer discovery protocol (LLDP) Uninterrupted service forwarding upon CAPWAP tunnel disconnection in Fit AP mode Unified authentication on the WAC in Fit AP mode WAC dual-link backup in Fit AP mode Network address translation (NAT) in Fat AP mode IPv6 in Fit AP mode Telemetry in Fit AP mode, quickly collecting AP status and application experience parameters IPv6 source address validation improvements (SAVI) Soft generic routing encapsulation (GRE) Multicast Domain Name Service (mDNS) gateway protocol
QoS features	WMM power saving Priority mapping for uplink packets; flow-based mapping for downlink packets Queue mapping and scheduling User-based bandwidth limiting Adaptive bandwidth management (automatic bandwidth adjustment based on the user quantity and radio environment) for user experience improvement Airtime scheduling Air interface HQoS scheduling Acceleration for VR and mobile gaming applications Intelligent multimedia scheduling algorithm
Security features	Open system authentication WEP authentication/encryption using a 64-bit, 128-bit, 152-bit or 192-bit encryption key WPA2-PSK authentication and encryption (WPA2-Personal) WPA2-802.1X authentication and encryption (WPA2-Enterprise) WPA3-SAE authentication and encryption (WPA3-Personal) WPA3-802.1X authentication and encryption (WPA3-Enterprise) WPA-WPA2 hybrid authentication WPA2-WPA3 hybrid authentication WPA2-PPSK authentication and encryption in Fit AP mode WAPI authentication and encryption

Item	Description
	WIDS/WIPS, including rogue device detection and containment, attack detection and dynamic blacklist, and STA/AP blacklist and whitelist 802.1X authentication, MAC address authentication, Portal authentication, etc. DHCP snooping Dynamic ARP inspection (DAI) IP Source Guard (IPSG) 802.11w Protected Management Frames (PMF) Hardware encryption: IPsec and DTLS
Maintenance features	Unified management and maintenance on the WAC in Fit AP mode Automatic login, automatic configuration loading, and plug-and-play (PnP) in Fit AP mode Automatic batch upgrade in Fit AP mode Telnet STelnet using SSHv2 SFTP using SSHv2 Remote wireless O&M through Bluetooth console ports Web system-based AP management and login through HTTP or HTTPS in Fat AP mode Real-time configuration monitoring and fast fault locating using the NMS SNMPv1/v2/v3 in Fat AP mode System status alarm Network Time Protocol (NTP) in Fat AP mode
Location service	NOTE The AP supports the location service only in Fit and cloud AP modes. STA location Working with a location server to locate rogue devices
BYOD	NOTE The AP supports BYOD only in Fit AP mode. Device type identification according to the organizationally unique identifier (OUI) in the MAC address Device type identification based on the user agent (UA) information in an HTTP packet Device type identification based on DHCP options The RADIUS server delivers packet forwarding, security, and QoS policies according to the device type carried in the RADIUS authentication and accounting packets.
Spectrum analysis	NOTE The AP supports spectrum analysis only in Fit AP mode. Identification of multiple interference sources including Bluetooth devices, microwave ovens, cordless phones, ZigBee devices, game controllers, 2.4 GHz/5 GHz wireless video and audio devices, and baby monitors Working with a location server to locate interference sources and perform spectrum analysis on them

Cloud-based management mode

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WLAN features	Compliance with IEEE 802.11ax and compatibility with IEEE 802.11a/b/g/n/ac/ac Wave 2 Maximum ratio combining (MRC) Space time block code (STBC) Cyclic delay diversity (CDD)/Cyclic shift diversity (CSD) Beamforming Multi-user multiple-input multiple-output (MU-MIMO) Orthogonal frequency division multiple access (OFDMA) Compliance with 1024-QAM and compatibility with 256-QAM/64-QAM/16-QAM/8-QAM/QPSK/BPSK Target wake time (TWT) Low-density parity-check (LDPC) Frame aggregation, including A-MPDU (Tx/Rx) and A-MSDU (Tx/Rx) 802.11 dynamic frequency selection (DFS) Short GI in 20 MHz, 40 MHz, 80 MHz, and 160 MHz modes Priority mapping and scheduling that are compliant with Wi-Fi multimedia (WMM) to implement priority-based data processing and forwarding WLAN channel management and channel rate adjustment NOTE For detailed management channels, see <i>Country Code & Channel Compliance Table</i>. Automatic channel scanning and interference avoidance Separate service set identifier (SSID) hiding configuration for each AP, supporting Chinese SSIDs Signal sustain technology (SST) Unscheduled automatic power save delivery (U-APSD) Automatic AP login 802.11k and 802.11v smart roaming 802.11r fast roaming (≤ 50 ms) Advanced cellular coexistence (ACC), minimizing the impact of interference from cellular networks
Network features	Compliance with IEEE 802.3ab Auto-negotiation of the rate and duplex mode and automatic switchover between the Media Dependent Interface (MDI) and Media Dependent Interface Crossover (MDI-X) Compliance with IEEE 802.1Q VLAN assignment by SSID DHCP client, obtaining IP addresses through DHCP STA isolation in the same VLAN Access control list (ACL) Unified authentication on the cloud management platform NAT Telemetry, quickly collecting AP status and application experience parameters
QoS features	WMM power saving Priority mapping for uplink packets; flow-based mapping for downlink packets Queue mapping and scheduling User-based bandwidth limiting

Item	Description
	Airtime scheduling Air interface HQoS scheduling Acceleration for VR and mobile gaming applications
Security features	Open system authentication WEP authentication/encryption using a 64-bit, 128-bit, 152-bit or 192-bit encryption key WPA2-PSK authentication and encryption (WPA2-Personal) WPA2-802.1X authentication and encryption (WPA2-Enterprise) WPA3-SAE authentication and encryption (WPA3-Personal) WPA3-802.1X authentication and encryption (WPA3-Enterprise) WPA-WPA2 hybrid authentication WPA2-WPA3 hybrid authentication WPA2-PPSK authentication and encryption 802.1X authentication, MAC address authentication, Portal authentication, etc. DHCP snooping Dynamic ARP inspection (DAI) IP Source Guard (IPSG)
Maintenance features	Unified management and maintenance on the cloud management platform Automatic login, automatic configuration loading, and plug-and-play (PnP) Batch upgrade Telnet STelnet using SSHv2 SFTP using SSHv2 Remote wireless O&M through Bluetooth console ports Web-based NMS, and login through HTTP or HTTPS Real-time configuration monitoring and fast fault locating using the NMS System status alarm NTP

Product Specifications

Item		Description
Technical specifications	Installation mode	Wall mounting Ceiling mounting T-rail mounting
	Dimensions (diameter x height)	Φ 220 mm x 50 mm
	Weight	1.08 kg
	Port	1 x 10M/100M/GE/2.5GE electrical port 1 x 10M/100M/GE electrical port

Item		Description
		1 x USB port NOTE The 2.5GE port supports PoE-In. If the BOM code is 02353XBQ, the port is a GE port.
	Bluetooth (BLE)	BLE 5.2
	LED indicator	Indicate the power-on, startup, running, alarm, and fault states of the system.
Power supply specifications	Power input	DC: 12 V $\pm$ 10% PoE power supply: in compliance with IEEE 802.3at NOTE For details about the device working status in different power supply modes, see the Quick Information Check website.
	Maximum power consumption	21.2 W (excluding USB) NOTE The actual maximum power consumption depends on local laws and regulations.
Environmental specifications	Operating temperature	-10°C to +50°C (From 1800 m to 5000 m, the maximum operating temperature of the device decreases by 1°C for every 300 m increase in altitude.)
	Storage temperature	-40°C to +70°C
	Operating humidity	5% to 95% (non-condensing)
	Altitude	-60 m to +5000 m
	Atmospheric pressure	53 kPa to 106 kPa
IP rating	IP rating	IP41
Radio specifications	Antenna type	Built-in smart antenna
	Antenna gain	2.4 GHz: 4 dBi 5 GHz: 5 dBi NOTE - The preceding gain is the peak gain of a single antenna. - Equivalent antenna gain after all 2.4 GHz or 5 GHz antennas are combined: 2 dBi for 2.4 GHz and 3 dBi for 5 GHz.
	Maximum quantity of SSIDs on each radio	≤ 16
	Maximum number of STAs	≤ 1536 (512/radio) NOTE The actual number of users varies according to the environment.
	Maximum transmit power	2.4 GHz: 25 dBm (combined power) 5 GHz (2x2 MIMO): 23 dBm (combined power) 5 GHz (4x4 MIMO): 26 dBm (combined power) BLE: < 10 dBm NOTE

Item		Description
		The actual transmit power varies according to local laws and regulations.
	Power adjustment increment	1dBm
	Maximum number of non-overlapping channels	2.4 GHz (2.412 GHz to 2.472 GHz) 802.11b/g 20 MHz: 3 802.11n 20 MHz: 3 40 MHz: 1 802.11ax 20 MHz: 3 40 MHz: 1 5 GHz (5.18 GHz to 5.825 GHz) 802.11a 20 MHz: 13 802.11n 20 MHz: 13 40 MHz: 6 802.11ac 20 MHz: 13 40 MHz: 6 80 MHz: 3 160 MHz: 1 802.11ax 20 MHz: 13 40 MHz: 6 80 MHz: 3 160 MHz: 1 NOTE In this table, the number of non-overlapping channels supported in China is used as an example. The number of non-overlapping channels varies with countries. For details, see <i>Country Code & Channel Compliance Table</i>.

Standards Compliance

Item	Description		
Safety standards	- UL 60950-1 - EN 60950-1	- UL 62368-1 - EN 62368-1	- GB 4943.1 - CAN/CSA 22.2 No.60950-1

Item	Description		
	IEC 60950-1	IEC 62368-1	
Radio standards	ETSI EN 300 328	ETSI EN 301 893	AS/NZS 4268
EMC standards	- EN 301 489-1 - EN 301 489-17 - EN 60601-1-1 - EN 60601-1-2 - EN 55024 - EN 55032 - EN 55035	- GB 9254 - GB 17625.1 - GB 17625.2 - AS/NZS CISPR32 - CISPR 24 - CISPR 32 - CISPR 35	- IEC/EN61000-4-2 - IEC/EN 61000-4-3 - IEC/EN 61000-4-4 - IEC/EN 61000-4-5 - IEC/EN61000-4-6 - ICES-003
IEEE standards	- IEEE 802.11a/b/g - IEEE 802.11n - IEEE 802.11ac - IEEE 802.11ax	- IEEE 802.11h - IEEE 802.11d - IEEE 802.11e - IEEE 802.11k	- IEEE 802.11v - IEEE 802.11w - IEEE 802.11r
Security standards	802.11i, Wi-Fi Protected Access (WPA), WPA2, WPA2-Enterprise, WPA2-PSK, WPA3, WAPI 802.1X - Advanced Encryption Standards (AES), Temporal Key Integrity Protocol (TKIP), WEP, Open - EAP Type(s)		
EMF standards	EN 62311	EN 50385	
RoHS standards	Directive 2002/95/EC & 2011/65/EU	(EU)2015/863	
Reach standards	Regulation 1907/2006/EC		
WEEE standards	Directive 2002/96/EC & 2012/19/EU		

More Information

For more information about Huawei WLAN products, visit <http://e.huawei.com> or contact Huawei's local sales office.

Alternatively, you can contact us through one of the following methods:

1. Global service hotline: <http://e.huawei.com/en/service-hotline>
2. Enterprise technical support website: <http://support.huawei.com/enterprise/>
3. Service email address for enterprise users: support_e@huawei.com

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