CloudEngine S5735-S-IA Series Video Backhaul Switch

CloudEngine S5735-S-IA series video backhaul switches are feature-rich switches developed by Huawei for outdoor scenarios. This series integrates a wide range of modules, including extended-temperature switch unit, surge protector, multi-channel power output, fiber splice tray, protection shell, and mechanical lock, onto a single device for one-stop delivery of an outdoor video access point.

Product Overview

The CloudEngine S5735-S-IA series video backhaul switches use high-performance hardware and Huawei Versatile Routing Platform (VRP) to provide flexible gigabit access and 10GE uplink ports, support simple O&M and flexible Ethernet networking, and provide enhanced Layer 3 features and mature IPv6 functions. This switch series supports industrial-grade operating temperature ranges and professional outdoor surge protection. They are protected to IP55 and have anti-salt spray capabilities, and can be used in harsh outdoor environments, such as safe cities, highways, expressways, campuses, and scenic spots. The integrated design of the product solves a series of problems in transmission, power supply, and fast deployment of video sites. Intelligent management methods such as remote network management greatly reduce the site fault rate and O&M investment, and improve the online rate of the entire video site.

The series has three models: CloudEngine S5735-S4T2X-IA150G1, CloudEngine S5735-S8P2X-IA200G1, and CloudEngine S5735-S8P2X-IA200H1.

Models and Appearances

Models and Appearances	Description
CloudEngine S5735-S4T2X-IA150G1	• Integrates multiple modules including the protection shell, surge protector, fiber splice tray, and multi-channel power output • 4 x 10/100/1000BASE-T Ethernet ports and 2 x 10GE SFP+ ports • Built-in AC power supply • Forwarding performance: 35.7 Mpps Switching capacity:168 Gbps
	• Integrates multiple modules including the protection shell, surge protector, fiber splice tray, and multi-channel power output • 8 x 10/100/1000Base-T Ethernet ports and 2 x 10GE SFP+ ports • PoE+ • Built-in AC power supply • Forwarding performance: 41.7 Mpps • Switching capacity:168 Gbps

Models and Appearances	Description
CloudEngine S5735-S8P2X-IA200G1	
  CloudEngine S5735-S8P2X-IA200H1	• Integrates multiple modules including the protection shell, surge protector, fiber splice tray, and multi-channel power output • 8 x 10/100/1000BASE-T Ethernet ports and 2 x 10GE SFP+ ports • PoE+ • Built-in AC power supply • External lithium batteries • Solar energy • Forwarding performance: 41.7 Mpps • Switching capacity: 168 Gbps

Features and Highlights

Industrial-Grade Reliability, withstanding harsh outdoor environments

- Extended operating temperature range (-40°C to $+75^{\circ}$C), enabling it to work in harsh outdoor environments.

- Built-in surge protector, meeting outdoor surge protection requirements.

- IP55-rated, easily adapting to complex outdoor environments.

- Salt spray protection, supporting installation in areas more than 500 meters from the sea.

High-level integration and easy installation/deployment

- Integrates multiple modules, including a built-in surge protector, fiber splice tray, PoE+ power supply, multi-channel power output (12 V DC/24 V AC), protection shell, and mechanical lock, eradicating the need for on-site installation. Additionally, the switch is easy to be wall- or pole-mounted as it is light in weight.

- Supports Super Virtual Fabric (SVF) that virtualizes "Core/Aggregation + Access Switches" into a single logical device. The CloudEngine S5735-S-IA can function as the SVF client. SVF provides the innovative network management solution in the industry, simplifies device management, and supports plug-and-play of devices, as well as supporting service configuration profiles. These profiles are configured on the core device and automatically delivered to access devices, implementing centralized control, simplifying service configuration, and enabling flexible configuration modification.

- Supports zero-touch provisioning (ZTP), USB-based deployment, configuration-free replacement of a faulty device, batch configuration, and batch remote upgrade. These functions facilitate device deployment, service provisioning, and other management and maintenance work, greatly reducing O&M costs. The switch can be managed and maintained using Simple Network Management Protocol (SNMP) v1, v2c, and v3, command line interface (CLI), web system, or Secure Shell (SSH) v2.0. Additionally, it supports remote network monitoring (RMON), multiple log hosts, interface traffic statistics collection, and network quality analysis that facilitates network optimization and reconstruction.

Professional video Processing features

- Smart Fault Diagnosis (SFD) of the downstream IP cameras (IPCs): Specifically, the switch works with Huawei's network management system—eSight—to implement fast fault diagnosis based on the device management status, port status, and alarms of the network path on which the IPC resides, and quickly demarcate the type of fault that led to the IPC disconnection (for example, an IPC fault, network device fault, power failure, or optical fiber link fault). This capability improves O&M efficiency, reduces O&M costs, and increases the IPC connectivity rate.

- eMDI video quality demarcation: The switch works with Huawei eSight to analyze video service quality and quickly demarcate the video quality problem type, such as artifacts and frame freezing on the screen when playing a video.

- Mechanical lock and alarm reporting upon cover being opened: It can quickly detect damage and intrusion, ensuring device security.

Leading PoE+ power supply

- Support for PoE+: A single PoE+ port can provide a maximum of 30 W power.

- Long-distance PoE+ power supply: When a PoE+ port works in GE mode, the Ethernet cable of Cat5e or higher specifications is used to provide a 100 m power supply distance.

- Fast PoE: The switch can supply power to PDs within 10s after it is powered on. This is different from common switches that generally take 1 to 3 minutes to start to supply power to PDs. The fast PoE capability greatly shortens the service interruption time caused by power supply outage, and enables the switch and PDs to start almost at the same time. That is, after the switch is fully started, PDs can immediately function properly.

- Perpetual PoE technology: The switch supplies uninterrupted power to PDs even when it reboots, eliminating fault-triggered interruptions.

Powerful Service Processing Capability and Multiple Security Control Mechanisms

- Various Layer 2 and Layer 3 multicast protocols, including Protocol Independent Multicast Sparse Mode (PIM SM), PIM Dense Mode (DM), PIM Source-Specific Multicast (SSM), Multicast Listener Discovery (MLD), and Internet Group Management Protocol (IGMP) snooping, ensuring high-quality HD video services.

- Layer 3 features, such as Open Shortest Path First (OSPF), Intermediate System to Intermediate System (IS-IS), Border Gateway Protocol (BGP), and Virtual Router Redundancy Protocol (VRRP), meeting enterprise access and aggregation service requirements and supporting more voice, video, and data applications.

- MAC address authentication, 802.1X authentication, Portal authentication, and dynamic delivery of user policies (VLAN, QoS, and ACL).

- Series of mechanisms to defend against DoS attacks and user-targeted attacks. DoS attacks are targeted at switches and include SYN flood, LAND, Smurf, and ICMP flood attacks. User-targeted attacks include bogus DHCP server attacks, IP/MAC address spoofing, DHCP request flood, and changing the DHCP CHADDR value.

- Setting up and maintaining a DHCP snooping binding table, and discarding the packets that do not match the table entries. DHCP snooping allows a physical port to be configured as a trusted or untrusted port to ensure that users are connected to only authorized DHCP servers.

- Strict ARP learning, protecting the network against ARP spoofing attacks and ensuring normal network access.

Multiple Reliability Mechanisms

- Huawei-developed Smart Ethernet Protection (SEP) technology and the latest Ethernet ring protection switching (ERPS) standard in addition to the traditional Spanning Tree Protocol (STP), Rapid Spanning Tree Protocol (RSTP), and Multiple Spanning Tree Protocol (MSTP). SEP is a ring protection protocol dedicated to the Ethernet link layer. It is applicable to various ring topologies such as open ring topology, closed ring topology, and cascading ring topology. SEP is reliable and easy to maintain, and implements fast protection switching (under 50 ms). ERPS is defined in ITU-T G.8032. It implements protection switching within milliseconds based on the traditional Ethernet MAC and bridging functions.

- Smart Link. One switch can be connected to multiple aggregation switches through multiple links to implement uplink backup, greatly improving the reliability of access devices.

- Ethernet OAM (IEEE 802.3ah/802.1ag), quickly detecting link faults.

- The all-in-one chassis supports current leakage protection, short-circuit protection, and automatic detection and recovery mechanisms. In the event of a short circuit, the CloudEngine S5735-S-IA can automatically power off to protect its components. In addition, it supports the short circuit detection and protection function for connected terminals. Once the short circuit is recovered, the switch automatically resumes power supply. Moverover, the switch supports current leakage protection, and has passed the 700 V DC and 1200 V AC surge test before delivery to ensure device security.

Mature IPv6 Technologies

- The CloudEngine S5735-S-IA series video backhaul switch uses the mature, stable VRP platform and supports IPv4/IPv6 dual stack, IPv6 RIPng, and IPv6 over IPv4 tunnels including manually configured, 6to4, and Intra-Site Automatic Tunnel Addressing Protocol (ISATAP) tunnels. With these IPv6 features, the switch can be deployed on IPv4-only networks, IPv6-only networks, or networks that run both IPv4 and IPv6, meeting the requirements for IPv4-to-IPv6 transition.

Intelligent Upgrade

- Switches support the intelligent upgrade feature. Specifically, switches obtain the version upgrade path and download the newest version for upgrade from the Huawei Online Upgrade Platform (HOUP). The entire upgrade process is highly automated

and achieves one-click upgrade. In addition, preloading the version is supported, which greatly shortens the upgrade time and service interruption time.

- The intelligent upgrade feature greatly simplifies device upgrade operations and makes it possible for the customer to upgrade the version independently. This greatly reduces the customer's maintenance costs. In addition, the upgrade policies on the HOUP platform standardize the upgrade operations, which greatly reduces the risk of upgrade failures.

Efficient PV Power Generation

- PV modules can be configured to support solar power input, significantly cutting costs compared to mains and making it possible to deploy switches in areas without mains. The switches support a maximum of 1400 W solar power input with a wide voltage range (30 V DC to 120 V DC). The maximum power point tracking (MPPT) accuracy is over 98%, and the energy efficiency is high, meeting the energy requirements of an entire site's devices and lithium batteries.

Reliable Lithium Batteries for Power Backup

- Switches use smart lithium iron phosphate (LFP) batteries for power backup. The batteries are small in size and light in weight, facilitating pole-mounting and reducing the chance of theft. Additionally, the LFP batteries can be charged and discharged 3500 times (35°C, 80% depth of discharge), three times more times than lead-acid batteries widely used in the industry. The capacity of batteries can be flexibly configured (20 Ah, 50 Ah, 100 Ah, or 200 Ah) to provide backup power of 8 – 72 hours for the entire site. Low-temperature lithium batteries can also be configured, which can even be charged at –20° C and discharged at –40° C. This is far better than most batteries in the industry, which are generally unable to be charged and discharged at temperatures lower than 0° C.

Multi-mode Power Supply Scheduling and Management

- Switches support multiple power supply modes: solar energy, lithium batteries, and mains (listed in descending order of priority). These modes can be switched without any delay, conserving energy while ensuring high service reliability.

- The status of power supplies and battery groups can be queried in real time. Parameters such as the charge current limit coefficient, current limiting in case of high temperature, and equalized charging voltage can be set for lithium battery groups, facilitating management and O&M.

Product Specifications

Item	CloudEngine S5735-S4T2X-IA150G1	CloudEngine S5735-S8P2X-IA200G1
Fixed port	4 x 10/100/1000Base-T ports and 2 x 10G SFP+ ports	8 x 10/100/1000Base-T ports and 2 x 10G SFP+ ports
Management port	Ethernet management port ,Console port (RJ45)	Ethernet management port, console port (RJ45), and USB 2.0 port
PoE	Not supported	- 8 PoE+ ports, each providing up to 30 W power - 802.3af/802.3at standards compliance - Maximum total PoE output power: 160 W
Dimensions (H x W x D)	550 mm x 300 mm x 135 mm	550 mm x 300 mm x 135 mm
Net weight	9.2kg	9.2kg
Rated voltage range	220 V AC to 240 V AC, 50/60 Hz	220 V AC to 240 V AC, 50/60 Hz
Maximum voltage range	176 V AC to 264 V AC, 45 Hz to 66 Hz	176 V AC to 264 V AC, 45 Hz to 66 Hz
Maximum power consumption (100% throughput)	29 W	- No power output: 34 W - 100% power output: 209 W (system power consumption: 49 W; power output: 160 W)
Typical power consumption (30% of traffic load, without PoE	28 W	31 W

Item	CloudEngine S5735-S4T2X-IA150G1	CloudEngine S5735-S8P2X-IA200G1
power output)		
Power output	- Maximum total output power of 12 V DC + 24 V AC: 144 W 12 V DC (five outputs): 72 W in total, with a maximum of 72 W for each output 24 V AC (two outputs): 72 W in total, with a maximum of 72 W for each output 220 V AC (Optional)	- Maximum total output power of 12 V DC + 24 V AC + PoE: 160 W 12 V DC (five outputs): 72 W in total, with a maximum of 72 W for each output 24 V AC (two outputs): 72 W in total, with a maximum of 72 W for each output - Eight PoE ports provide a maximum of 160 W power 220 V AC (Optional)
Fiber splice tray	Built-in(Optional)	
Protection rating	IP55	
Operating temperature	-40℃ to +75℃ **NOTE** –25ºC to +75ºC : sunshade needed; 400 LFM air velocity (minimum); GPON optical modules not supported –25ºC to +70ºC : sunshade needed; 200 LFM air velocity (minimum); GPON optical modules supported –30ºC to +60ºC : sunshade needed; 40 LFM air velocity (minimum); GPON optical modules supported –35ºC to +55ºC : sunshade needed; no requirement on the air velocity; GPON optical modules supported –35ºC to +45ºC : 1120 W/m^2 solar radiation (maximum); no requirement on the air velocity –40ºC to –35ºC : At least four Ethernet electrical ports must be working. When the altitude is 1800-4000 m , the highest operating temperature reduces by 1°C every time the altitude increases by 220 m.	
Power supply surge protection	Surge current: - AC input: 20 kA Surge: - AC input: ±6 kV in differential mode; ±6 kV in common mode 12 V DC output: ±2 kV in differential mode; ±4 kV in common mode 24 V AC output: ±2 kV in differential mode; ±6 kV in common mode	
Service port surge protection	±1.5 kV in differential mode, ±6 kV in common mode	
Salt spray protection	Supported, allowing the switch to be installed in areas more than 500 meters away from the sea	
Operating altitude	0-4000 m	
Heat dissipation	Natural heat dissipation	
Installation mode	Wall-mounted or pole-mounted	

Item	CloudEngine S5735-S8P2X-IA200H1
Fixed port	8 x 10/100/1000BASE-T PoE+ ports and 2 x 10GE SFP+ ports
Management port	Ethernet management port, console port (RJ45), and USB 2.0 port

Item	CloudEngine S5735-S8P2X-IA200H1
PoE	8 PoE+ ports, each providing up to 30 W power 802.3af/802.3at standards compliance - Maximum total PoE output power: 200 W
Dimensions (H x W x D)	570mm x 300mm×150mm
Net weight	14.5 kg

Mains input	Rated voltage range	220 V AC to 240 V AC, 50/60 Hz
	Maximum voltage range	85 V AC to 290 V AC, 45 Hz to 66 Hz
	Surge protection	Surge current: - AC input: 20 kA in differential mode; 20 kA in common mode Surge: - AC input: ±6 kV in differential mode; ±6 kV in common mode
Solar power input	Solar input voltage	36 V to 120 V (typical value: 72 V)
	Solar input power	0 W to 1400 W
	Surge protection	Surge current: 3 kA in differential mode; 5 kA in common mode Surge: ±2 kV in differential mode; ±4 kV in common mode
Input of stored energy	Type of stored energy	Lithium battery
	Charging current	Maximum: 20 A
	Charging voltage	43.2 V to 56.5 V
	Input power	30–58 V: 500 W 58–72 V: 1400 W > 72 V: 1000 W
	Surge protection	Surge current: 3 kA in differential mode; 5 kA in common mode Surge: ±2 kV in differential mode; ±4 kV in common mode
Power output	Power output mode	12 V DC (two outputs) 24 V AC (two outputs) 220 V AC (standard configuration)
	Output power	- Maximum total output power of 12 V DC + 24 V AC + PoE: 200 W 12 V DC (two outputs): 72 W in total, with a maximum of 72 W for a single output 24 V AC (two outputs): 100 W in total, with a maximum of 100 W for a single output - Eight PoE ports: a maximum of 200 W output power
	Surge protection	12 V DC output: ±2 kV in differential mode; ±4 kV in common mode 24 V AC output: ±2 kV in differential mode; ±6 kV in common mode - Service port: ±1.5 kV in differential mode; ±6 kV in common mode

Item	CloudEngine S5735-S8P2X-IA200H1
Maximum power consumption (100% throughput)	• No power output: 45 W • 100% power output: 269 W (system power consumption: 69 W; power output: 200 W)
Typical power consumption (30% of traffic load, without PoE power output)	38 W
Fiber splice tray	Built-in (standard configuration)
Protection rating	IP55
Operating temperature	–40°C to +55°C **NOTE** –35ºC to +55ºC: sun shield needed; no requirement on the air velocity; GPON optical modules supported –35ºC to +45ºC: 1120 W/m^2 solar radiation (maximum); no requirement on the air velocity –40ºC to –35ºC: At least four Ethernet electrical ports must be working. When the altitude is 1800–4000 m, the highest operating temperature reduces by 1°C every time the altitude increases by 220 m.
Salt spray protection	Supported, allowing the switch to be installed in areas more than 500 meters away from the sea
Operating altitude	-150 m to +5000 m
Heat dissipation	Natural heat dissipation
Installation mode	Wall-mounted or pole-mounted

Service Features

Item	Description
MAC	IEEE 802.1d compliance
	16K MAC address entries
	Automatic learning and aging of MAC address entries
	Static, dynamic, and blackhole MAC address entries
	Packet filtering based on source MAC addresses
VLAN	4K VLANs
	Guest VLAN and voice VLAN
	GVRP
	MUX VLAN
	VLAN assignment based on MAC addresses, protocols, IP subnets, policies, and ports
	VLAN mapping
Reliability	RRPP ring topology and RRPP multi-instance
	Smart Link tree topology and Smart Link multi-instance, providing protection switching within

| Item	Description
	milliseconds
	SEP
	STP (IEEE 802.1d), RSTP (IEEE 802.1w), and MSTP (IEEE 802.1s)
	ERPS (G.8032)
	BPDU protection, root protection, and loop protection
IP routing	Static routing, RIPv1/v2, RIPng, OSPF, OSPFv3, IS-IS, IS-ISv6, BGP, BGP4+, VRRP, VRRP6, and ECMP
IPv6 features	Neighbor Discovery (ND)
	Path MTU (PMTU)
	IPv6 ping, IPv6 tracert, and IPv6 Telnet
	6to4 tunnels, ISATAP tunnels, and manually configured tunnels
Multicast	IGMP v1/v2/v3, PIM-SM, PIM-DM, and PIM-SSM
	IGMP v1/v2/v3 snooping and IGMP fast leave
	MLD v1/v2 and MLD v1/v2 snooping
	Intra-VLAN multicast forwarding and inter-VLAN multicast replication
	Multicast load balancing among member ports of a trunk link
	Controllable multicast
	Port-based multicast traffic statistics collection
QoS/ACL	Inbound and outbound traffic rate limiting on a port
	Packet redirection
	Port-based traffic policing and two-rate, three-color CAR
	Eight queues per port
	DRR, SP, and DRR+SP queue scheduling algorithms
	Re-marking of the 802.1p priority and DSCP value of packets
	Packet filtering on Layer 2 to Layer 4, filtering out invalid frames based on the source MAC address, destination MAC address, source IP address, destination IP address, TCP/UDP source/destination port number, protocol number, and VLAN ID
	Queue-based rate limiting and traffic shaping on ports
Security features	Hierarchical user management and password protection
	DoS attack defense, ARP attack defense, and ICMP attack defense
	Binding of the IP address, MAC address, port number, and VLAN ID
	Port isolation, port security, and sticky MAC
	MAC Forced Forwarding (MFF)
	Blackhole MAC address entries
	Limit on the number of learned MAC addresses
	IEEE 802.1X authentication and limit on the number of users on a port

Item	Description
	AAA authentication, RADIUS authentication, and HWTACACS authentication
	NAC
	SSH v2.0
	HTTPS
	CPU protection
	Blacklist and whitelist
	DHCPv4/v6 client/relay/server/snooping
	Attack source tracing and punishment for IPv6 packets such as ND, DHCPv6, and MLD packets
	Separation between user authentication and policy enforcement points
Reliability	LACP
	E-trunk
	Ethernet OAM (IEEE 802.3ah and 802.1ag)
	ITU-Y.1731
	DLDP
	LLDP
	BFD for BGP/IS-IS/OSPF/static route
Super Virtual Fabric (SVF)	Plug-and-play
	Automatic loading of software and patches
	One-click automatic provisioning of services
	Configuration of an AS in independent mode and configuration of services that are not supported by the profile on the parent
OAM	EFM
	CFM
	Y.1731
Management and maintenance	Virtual cable test
	SNMPv1/v2c/v3
	RMON
	Network management system (NMS) and web-based network management features
	System logs and multi-level alarms
	sFlow
	NETCONF
	Dying gasp
	Alarms upon opening the cover of the device
	Offline IPC fault diagnosis
	eMDI

Item	Description
Interconnection and interoperability	VLAN-based Spanning Tree (VBST) (compatible with PVST/PVST+/RPVST)
	Link-type Negotiation Protocol (LNP) (similar to DTP)
	VLAN Central Management Protocol (VCMP) (similar to VTP)

Networking and Applications

Video Backhaul Network in Safe City Scenarios

The CloudEngine S5735-S-IA series video backhaul switch supports an extended operating temperature range, has a built-in surge protector, and provides IP55 protection as well as salt spray protection capabilities. It is applicable to outdoor environments and can be used in Safe City scenarios to provide long-distance PoE access for cameras.
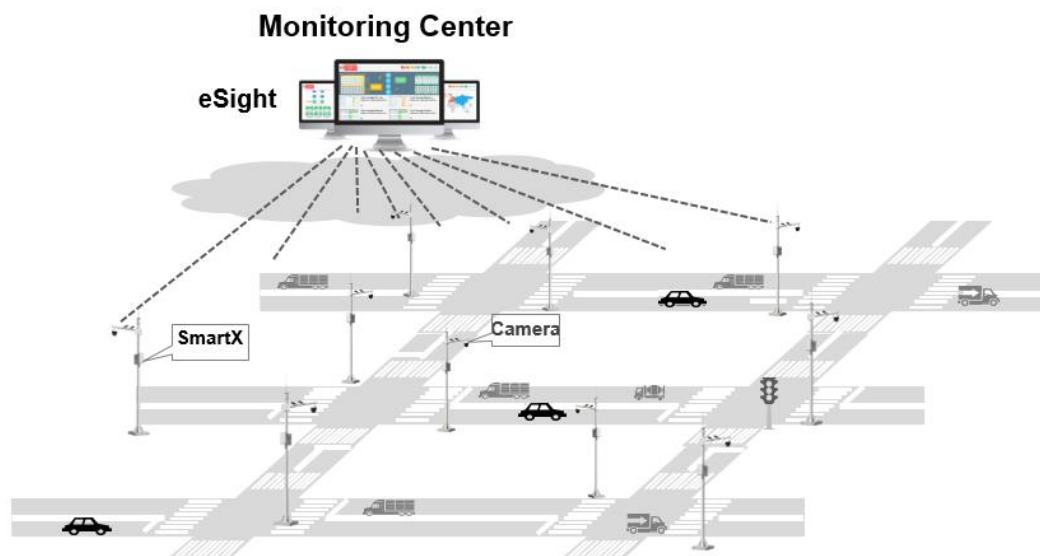
Multi-mode Power Supply Scenarios

The CloudEngine S5735-S8P2X-IA200H1 supports solar energy and mains input, as well as highly reliable lithium batteries for power backup. With such power supply modes, the switch can be flexibly used in areas with good mains, poor mains, and even no mains, breaking through the restrictions of onsite power grid. The following table lists the recommended typical configurations in a scenario where the power consumption of box cameras and PTZ dome cameras is 60 W.

Scenario		Device	Power Supply Configuration
Solar power input scenario, 72-hour backup power		S5735-S8P2X-IA200H1	335 Wp PV module + 200 Ah lithium battery

Scenario		Device	Power Supply Configuration
Mains input scenario, 24-hour backup power		S5735-S8P2X-IA200H1	50 Ah lithium battery
Mains input scenario, 10-hour backup power		S5735-S8P2X-IA200H1	20 Ah lithium battery

Ordering Information

Module	Description
CloudEngine S5735-S4T2X-IA150G1	CloudEngine S5735-S4T2X-IA150G1 (4*10/100/1000BASE-T ports, 2*10GE SFP+ ports, AC power supply)
CloudEngine S5735-S8P2X-IA200G1	CloudEngine S5735-S8P2X-IA200G1 (8*10/100/1000BASE-T ports, 2*10GE SFP+ ports, PoE+, AC power supply)
CloudEngine S5735-S8P2X-IA200H1	CloudEngine S5735-S8P2X-IA200H1 (8*10/100/1000BASE-T ports, 2*10GE SFP+ ports, PoE+, AC/PV/battery power supply)
STP335	PV Module, 335 W, 46.5 V, 9.5 A, 1960*992*40 mm, -40~85 degC, CE
ESM-48100B1	Energy Storage Module, ESM-48100B1, 48 V, 100Ah, 442 mm (W) x 396 mm (D) x 130 mm (H)
DBU50B-N12A1	Energy Storage Module, DBU50B-N12A1, 48 V, 50 Ah, 120 mm (W) x 300 mm (D) x 420 mm (H)
DBU20B-N12A3	Energy Storage Module, DBU20B-N12A3, 48 V,20 Ah, 120 mm (W) x 300 mm (D) x 420 mm (H)
Electronic Function,S5700,ES5FEA1,ES5SIVOM0002	5-year intelligent video O&M license,Electronic
Electronic Function,S5700,ES5FEA1,ES5	3-year intelligent video O&M license,Electronic

Module	Description
SIVOM0001	
Electronic Function,S5700,ES5FEA1,ES5 SIVOM0000	1-year intelligent video O&M license,Electronic

More Information

For more information about Huawei Campus Switches, visit http://e.huawei.com or contact us in the following ways:

- Global service hotline: http://e.huawei.com/en/service-hotline
- Logging in to the Huawei Enterprise technical support website: http://support.huawei.com/enterprise/
- Sending an email to the customer service mailbox: support_e@huawei.com

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