# RG-CS85 Series

Next-Generation
High-Performance GE Switches

INNOVATION
Beyond Networks

Ruijie

# 01
## Product Overview

The RG-CS85 series switches are high-performance, large capacity next-generation switches developed by Ruijie Networks. With next-generation switching chips in the industry and Ruijie Networks RGOS12.X modular operating system, the switches can provide more entries, faster hardware processing, and better operation experience.

The switches provide flexible GE access. Each model of the series provides four to eight fixed 10GE optical ports. The ports can connect to uplink high-density and high-performance ports to support high-density access and high-performance aggregation.

The RG-CS85 series switches provide robust performance, sound end-to-end service quality, and rich security settings for the aggregation layer of large-sized networks, the core layer of medium- and small-sized networks, and the servers in data centers in an extremely cost-effective manner. They can meet requirements of enterprise networks for high speed, security, and intelligence to the maximum.

The RG-CS85 series switches adopt next-generation switching chips and components to ensure that basic networks can keep updating and running continuously.

# 02
## Product Appearance

RG-CS85-24GT8XS-D

RG-CS85-24SFP/8GT8XS-D

RG-CS85-48GT4XS-D

RG-CS85-24GT8XS-D, RG-CS85-24SFP/8GT8XS-D and RG-CS85-48GT4XS-D (with CM85-4XS2CQ)

RG-CS85-24GT8XS-D, RG-CS85-24SFP/8GT8XS-D and RG-CS85-48GT4XS-D

RG-CS85-24GT8XS-D, RG-CS85-24SFP/8GT8XS-D and RG-CS85-48GT4XS-D

RG-CS85-48SFP4XS-D

RG-CS85-48GT4XS-HPD

# 03
# Product Features

## High Performance and Scalability

Each of the RG-CS85 series switches provides four to eight fixed 10GE optical ports. Users can flexibly select switches with different number of 10GE optical ports as needed. This meets requirements of network convergence in large enterprise campuses and core network deployment of medium- and small-sized networks. The switches support large amounts of entries, and provide a performance twice or three times higher than fixed aggregation switches at the same level.

## IPv4/IPv6 Dual-Stack Multi-Layer Switching

The hardware of the switches supports IPv4 and IPv6 protocol stacks and multilayer line-rate switching. The hardware differentiates and processes IPv4 and IPv6 packets. The switches also provide flexible IPv6 network communication solutions for users to perform network planning or maintain network status quo based on various IPv6 network demands. The switches support a wide range of IPv4 routing protocols, including static routing, Routing Information Protocol (RIP), Open Shortest Path First version 2 (OSPFv2), Intermediate System to Intermediate System version 4 (IS-ISv4), and Border Gateway Protocol version 4 (BGP4). Users can select appropriate routing protocols based on network environments, to flexibly build networks. The switches also support abundant IPv6 routing protocols, including static routing, Routing Information Protocol next generation (RIPng), OSPFv3, IS-ISv6, and BGP4+. You can select a routing protocol flexibly to either upgrade the existing network to an IPv6 network or build a new IPv6 network.

## Virtual Switching Unit

The RG-CS85 series switches support Virtual Switching Unit (VSU) technology. VSU enables multiple physical devices to be connected through aggregate links and virtualized into one logical device. The devices use the same IP address, Telnet process, and CLI for management, and support automatic version check and automatic configuration. By managing only one logical device, users can enjoy high efficiency and sound experience brought by multiple devices.

Aggregate links can be 10GE ports, and the maximum stack bandwidth is 80 G, maximizing the return on investment for users.

**Simplified management:** Administrators can manage multiple switches in a unified manner, with no need to connect to each switch for configuration and management.

**Simplified network topology:** A VSU serves as a switch on a network, and connects to peripheral devices through aggregate links. Therefore, no layer-2 loop exists, and the Multiple Spanning Tree Protocol (MSTP) does not need to be configured. Various control protocols run on the VSU.

**Fault recovery within milliseconds:** A VSU connects to peripheral devices through aggregate links. If one device or member link in the VSU fails, data and services can be switched to another member link within only 50 ms to 200 ms.

**High scalability:** User devices can be added to or removed from a virtualized network by hot swapping, without affecting normal operation of other devices.

## Sound Security Protection Policies

The switches effectively defend against virus spread and hacker attacks by using multiple inherent mechanisms such as DoS attack prevention, IP scanning prevention, validity check of port ARP packets, and multiple hardware-based ACL policies.

The hardware-based IPv6 ACL can easily control the access of IPv6 users at the network boundary even if there are IPv6 users on an IPv4 network. The switches allow the coexistence of IPv4 and IPv6 users, and can control access permissions of IPv6 users, for example, restricting access to sensitive resources on the network.

The switches provide a unique hardware CPU protection mechanism, the CPU Protect Policy (CPP). It classifies data traffic sent to the CPU, processes the traffic by queue priority, and limits the bandwidth rate as required. This protection mechanism fully protects the CPU against unauthorized traffic occupancy, malicious attacks, and resource consumption, to

ensure CPU security and protect the switches.

The switches adopt the innovative Network Foundation Protection Policy (NFPP) technology to limit the rate of sending ARP packets, ICMP requests, DHCP requests, and other packets to networks. The switch discards packets whose rate exceeds the threshold, identifies attacks, and isolates STAs launching attacks. This protects basic networks from network attacks to guarantee network stability.

The hardware of the switches flexibly binds a port or switch to a user's IP address and MAC address, to strictly restrict the access of users connected to a port or switch.

DHCP snooping enables the switches to receive DHCP responses only from trusted ports and prevent spoofing from unauthorized DHCP servers. With DHCP snooping, the switches dynamically monitor ARP packets, check users' IP addresses, and discard unauthorized packets that do not match bound entries, to effectively prevent ARP spoofing and source IP address spoofing.

The switches support Telnet device access control based on source IP addresses, which can prevent unauthorized users and hackers from maliciously attacking and controlling the devices. This enhances network management security of devices.

Through Secure Shell (SSH) and Simple Network Management Protocol version 3 (SNMPv3), the switches can encrypt management information in the Telnet and SNMP processes, to ensure information security of management devices, and to prevent hackers from attacking or controlling devices.

The switches reject unauthorized network access, and enables authorized users to use networks properly by employing multi-element binding, port security, time-based ACL, and rate limit based on data streams. This strictly controls user access to enterprise networks and campus networks, and restricts the communication of unauthorized users.

### High Reliability

With the Spanning Tree Protocols (STPs) (IEEE 802.1D, IEEE 802.1w, and IEEE 802.1s), the switches achieve fast convergence, improve the fault tolerance capability, and ensure stable network operation and link load balancing. In this way, the switches utilize network channels properly to raise the utilization of redundant links.

With the Virtual Router Redundancy Protocol (VRRP), the switches effectively ensure network stability.

With the Rapid Link Detection Protocol (RLDP), the switches can quickly detect the link connectivity and unidirectional optical fiber links. You can enable loop detection function on a port to prevent network failures caused by loops resulting from unauthorized port connection to hubs.

The switches support the Ethernet Ring Protection Switching (ERPS) technology, which is an international Layer 2 link redundancy backup protocol designed for the core Ethernet. The loop blocking and link recovery of ERPS are implemented on the controlling device, and non-controlling devices directly report their link status to the controlling device, without processing from other non-controlling devices. Therefore, loop disruption and recovery time of ERPS is faster than that of STP. Based on the above differences, ERPS supports link recovery within milliseconds in an ideal environment.

When STP is disabled, the Rapid Ethernet Uplink Protection Protocol (REUP) can still provide basic link redundancy and millisecond-level fault recovery faster than STP.

The switches support Bidirectional Forwarding Detection (BFD), which provides upper-level protocols (such as routing protocols) with a method of rapidly detecting connectivity of the forwarding path between two routers. BFD greatly shortens the convergence time for the upper-level protocols in the case of link status changes.

The switches support hardware-level dual-boot. The switches use two Flash chips to store boot software (system boot program) to achieve hardware-level boot redundancy backup, and to avoid switch boot failure due to FLASH chip faults.

### Strong Multi-Service Support Capability

The switches support IPv4 and IPv6 multicast functions as well as multiple multicast protocols, such as IGMP snooping, IGMP, MLD, PIM, and PIM for IPv6.

The switches can check IGMP source ports and source IP addresses to effectively eliminate unauthorized multicast sources and enhance network security.

The switches support abundant Layer 3 features and service features, such as equal-cost multi-path routing (ECMP)

## Sound QoS Policies

The switches are capable of classifying and controlling various flows, such as MAC flows, IP flows, and application flows, to implement various flow policies such as fine flow bandwidth control, and forwarding priority. In this way, the switches provide services based on applications and characteristics of service quality required by different applications.

The QoS guarantee system centering on DiffServ supports 802.1p, IP ToS, traffic filtering from Layer 2 to layer 7, SP, WRR, and other QoS policies, to implement QoS logic for multiple services throughout the network.

## Energy Saving

The RG-CS85 series switches adopt the next-generation hardware architecture, advanced energy-efficient circuit design and components, to efficiently reduce energy consumption and noise. The switches are equipped with variable-speed axial fans to intelligently control the fan speed based on the ambient temperature. This reduces power consumption and noise while ensuring stable operation of the switch.

## Flexible Device Management Modes

### Ruijie Cloud Make Your Business Easy

The RG-CS85 series switches support Ruijie

cloud APP to management, can bring customers simplified O&M management and user experience:

**Ease of networking:** Only a mobile phone available for Internet access is required to complete the device deployment. The switches support plug and play.

**Ease of O&M:** The O&M is simple. The network can be managed at any time, and you can manage the network wherever you go. VLAN visualized on Ruijie Cloud, lower technical barriers from configuration to management.

**Ease of monitoring:** You can view the network health and device details (system status, traffic trend, connectivity, power supply status, etc.) at any time. Faults and user network experience are visible, alarms are pushed in time once they are generated, and logs are generated to facilitate event traceback.

The RG-CS85 series switches also support the Simple Network Management Protocol (SNMP), Remote Network Monitoring (RMON), Syslog, Sampled Flow (sFlow), log and configuration backup using USB flash drives for routine network diagnosis and maintenance. Administrators can also use CLI, web-based management, telnet, CPE WAN Management Protocol (CWMP(TR069) based zero configuration and other methods to manage and maintain devices conveniently.

# 04
# Specifications

## Hardware Specifications

### Port Specifications

| Port Specifications | RG-CS85-24GT8XS-D | RG-CS85-24SFP/8GT8XS-D | RG-CS85-48GT4XS-D | RG-CS85-48SFP4XS-D | RG-CS85-48GT4XS-HPD |
|---|---|---|---|---|---|
| Fixed service port | 24 x 10/100/1000BASE-T ports 8 x 1GE/10GE SFP+ ports | 24 x 1GE SFP ports ● Ports 1 to 16 support the rate of 100Mbps, ports 17 to 24 do not support the rate of 100Mbps ● Ports 1 to 8 are 10/100/1000BASE-T combo ports 8 x 1GE/10GE SFP+ ports | 48 x 10/100/1000BASE-T ports 4 x 1GE/10GE SFP+ ports | 48 x 1GE SFP ports 4 x 1GE/10GE SFP+ ports | 48 x 10/100/1000BASE-T ports, supporting PoE/PoE+ 4 x 1GE/10GE SFP+ ports |

| Port Specifications | RG-CS85-24GT8XS-D | RG-CS85-24SFP/8GT8XS-D | RG-CS85-48GT4XS-D | RG-CS85-48SFP4XS-D | RG-CS85-48GT4XS-HPD |
|---|---|---|---|---|---|
| Module slot | 1 x expansion module slot<br>2 x power module slots | 1 x expansion module slot<br>2 x power module slots | 1 x expansion module slot<br>2 x power module slots | 1 x expansion module slot<br>2 x power module slots<br>3 x fan module slots | 1 x expansion module slot<br>2 x power module slots<br>2 x fan module slots |
| Expansion module | CM85-4XS2CQ | | | | |
| Power module | RG-PA150IB-F | RG-PA150IB-F | RG-PA150IB-F | RG-PA150IB-F | RG-PA600I-P-F<br>RG-PA1000I-P-F |
| Fan module | / | / | / | M2SFAN I-F (pre-installed 3) | M2SFAN I-F (pre-installed 2) |
| Module service port | CM85-4XS2CQ:<br>• 4 x 1GE/10GE SFP+ ports<br>• 2 x 40GE/100GE QSFP28 ports | | | | |
| Fixed management port | 1 x RJ45 console port<br>1 x RJ45 MGMT port | | | | |
| USB | 1 x USB 3.0 port | | | | |

## System Specifications

| System Specifications | RG-CS85-24GT8XS-D | RG-CS85-24SFP/8GT8XS-D | RG-CS85-48GT4XS-D | RG-CS85-48SFP4XS-D | RG-CS85-48GT4XS-HPD |
|---|---|---|---|---|---|
| Packet forwarding rate | 512 Mpps | 512 Mpps | 488 Mpps | 488 Mpps | 488 Mpps |
| Switching capacity | 688 Gbps | 688 Gbps | 656 Gbps | 656 Gbps | 656 Gbps |
| Real-time clock (RTC) | Supported | Supported | Supported | Supported | Supported |
| BootROM | 16 MB (2 flash chips for 1+1 boot redundancy) | | | | |
| Flash Memory | 4 GB | | | | |
| Memory | 1 GB | 1 GB | 1 GB | 2 GB | 2 GB |
| MAC address table size | 64,000 | | | | |
| ARP table size | 24,000 | | | | |
| Number of IPv4 unicast routes | 24,000 | | | | |
| Number of IPv4 multicast routes | 4,000 | | | | |
| Number of IPv6 unicast routes | 14,000 | | | | |
| Number of IPv6 multicast routes | 2,000 | | | | |
| Number of ACEs | Ingress: 7,000<br>Egress:1,500 | | | | |

| System Specifications | RG-CS85-24GT8XS-D | RG-CS85-24SFP/8GT8XS-D | RG-CS85-48GT4XS-D | RG-CS85-48SFP4XS-D | RG-CS85-48GT4XS-HPD |
|---|---|---|---|---|---|
| Number of VSU members | 4 | | | | |

## Dimensions and Weight

| Dimensions and Weight | RG-CS85-24GT8XS-D | RG-CS85-24SFP/8GT8XS-D | RG-CS85-48GT4XS-D | RG-CS85-48SFP4XS-D | RG-CS85-48GT4XS-HPD |
|---|---|---|---|---|---|
| Unit dimensions (W x D x H) | 440 mm x 340 mm x 44 mm (17.32 in. x 13.39 in. x 1.73 in.) | | | 442 mm x 420 mm x 43.6 mm (17.40 in. x 16.54 in. x 1.72 in.) | |
| Shipping dimensions (W x D x H) | 593 mm x 497 mm x 192 mm (23.35 in. x 14.57 in. x 7.56 in.) | | | 563 mm x 563 x mm 210 mm (22.17 in. x 22.17 in. x 8.27 in.) | |
| Rack height | 1 RU | | | | |
| Unit weight | 4.4 kg (9.70 lbs) | 4.3 kg (9.48 lbs) | 4.5 kg (9.92 lbs) | 5.3 kg (11.68 lbs) | 5.7 kg (12.57 lbs) |
| Shipping weight | 6.20 kg (13.67 lbs) | 6.62 kg (14.59 lbs) | 6.30 kg (13.89 lbs) | 7.70 kg (16.98 lbs) | 7.80 kg (17.20 lbs) |

## Power Supply and Consumption

| Power Supply and Consumption | RG-CS85-24GT8XS-D | RG-CS85-24SFP/8GT8XS-D | RG-CS85-48GT4XS-D | RG-CS85-48SFP4XS-D |
|---|---|---|---|---|
| Power supply | 2 x pluggable power modules | | | |
| Power module redundancy | 1+1 power redundancy | | | |
| Power input | RG-PA150IB-F (AC input):<br>• Rated input voltage: 100 V AC to 240 V AC, 50 Hz to 60 Hz<br>• Maximum input voltage: 90 V AC to 264 V AC, 47 Hz to 63 Hz<br>• Maximum input current: 3 A | | | |
| Maximum output power | RG-PA150IB-F: 150 W | | | |
| Maximum power consumption | 60 W (excluding expansion modules) 85 W (including expansion modules) | 77 W (excluding expansion modules) 102 W (including expansion modules) | 70 W (excluding expansion modules) 95 W (including expansion modules) | 105W (excluding expansion modules) 125W (including expansion modules) |

| Power Supply and Consumption | RG-CS85-48GT4XS-HPD |
|---|---|
| Power supply | 2 x pluggable power modules |
| Power module redundancy | 1+1 power redundancy |
| Power module hot swapping | Supported |
| Power input | RG-PA600I-P-F (AC input):<br>• Rated input voltage: 100 V AC to 240 V AC, 50 Hz to 60 Hz<br>• Maximum input voltage: 90 V AC to 264 V AC, 47 Hz to 63 Hz<br>• Maximum input current: 10 A<br>RG-PA1000I-P-F (AC input 1):<br>• Rated input voltage: 100 V AC to 130 V AC, 50 Hz to 60 Hz<br>• Maximum input voltage: 90 V AC to 143 V AC, 47 Hz to 63 Hz<br>• Maximum input current: 12 A<br>RG-PA1000I-P-F (AC input 2):<br>• Rated input voltage: 200 V AC to 240 V AC, 50 Hz to 60 Hz<br>• Maximum input voltage: 180 V AC to 264 V AC, 47 Hz to 63 Hz<br>• Maximum input current: 8 A |
| Maximum output power | RG-PA600I-P-F: 600 W<br>RG-PA1000I-P-F:<br>• 100 V AC to 130 V AC: 930 W<br>• 200 V AC to 240 V AC: 1000 W |
| Maximum power consumption | 120 W (without PoE)<br>1,600 W (full PoE load) |
| PoE port | All RJ45 ports support PoE/PoE+ (IEEE802.3af/at) power supply |
| PoE power cable pairs | Mode A (1-2, 3-6 pairs) |
| PoE output power | Each PoE port provides up to 30 W of power, with a maximum power of 1440 W over 48 ports (30 W x 48).<br>The maximum power depends on the configured power supply<br>• 1 x RG-PA600I-P-F: 370 W<br>• 2 x RG-PA600I-P-F: 740 W<br>• 1 x RG-PA1000I-P-F: 740 W<br>• 2 x RG-PA1000I-P-F: 1480 W, a maximum output of 1440 W over 48 ports (30 W x 48)<br>Note: The maximum number of powered devices supported by the switch is determined by the available power of the switch and the actual power consumption of each device. |
| Energy saving | Supported |

## Environment and Reliability

| Environment and Reliability | RG-CS85-24GT8XS-D | RG-CS85-24SFP/8GT8XS-D | RG-CS85-48GT4XS-D | RG-CS85-48SFP4XS-D | RG-CS85-48GT4XS-HPD |
|---|---|---|---|---|---|
| Temperature | Operating temperature: 0°C to 45°C (32°F to 113°F)<br>Storage temperature: –40°C to +70°C (–40°F to +158°F) | | | | |
| Humidity | Operating humidity: 10% to 90% RH (non-condensing)<br>Storage humidity: 5% to 95% RH (non-condensing) | | | | |
| Altitude | Operating altitude: 0 m to 5,000 m (0 ft. to 16,404.20 ft.)<br>Storage altitude: 0 m to 5,000 m (0 ft. to 16,404.20 ft.) | | | | |
| Mean time between failure (MTBF) | 1,051,000 hours (about 120 years) | 823,000 hours (about 94 years) | 963,000 hours (about 110 years) | 788,000 hours (about 90 years) | 832,000 hours (about 95 years) |
| Fan | 3 x fixed fan modules | 3 x fixed fan modules | 3 x fixed fan modules | 3 x pluggable fan modules (pre-installed) | 2 x pluggable fan modules (pre-installed) |

| Environment and Reliability | RG-CS85-24GT8XS-D | RG-CS85-24SFP/8GT8XS-D | RG-CS85-48GT4XS-D | RG-CS85-48SFP4XS-D | RG-CS85-48GT4XS-HPD |
|---|---|---|---|---|---|
| Heat dissipation | Fan cooling, left-to-right airflow | Fan cooling, left-to-right airflow | Fan cooling, left-to-right airflow | Fan cooling, front-to-rear airflow | Fan cooling, front-to-rear airflow |
| Acoustic noise | 45°C (113°F) : 56.2 dB | 45°C (113°F) : 56.2 dB | 45°C (113°F) : 57.9 dB | 45°C (113°F) : 56.2 dB | 45°C (113°F) : 57.9 dB |
| Power module hot swapping | Supported | | | | |
| USB hot swapping | Supported | | | | |
| Cable hot swapping | Supported | | | | |
| Power supply monitoring | Fan speed adjustment: 3 levels<br>Fan failure alarming | | | | |
| Fan monitoring | Temperature monitoring, over-temperature alarming | | | | |
| Temperature monitoring | Monitoring of power supply model and status<br>Power supply failure alarming | | | | |
| ESD | ESD Contact/Air Discharge: 6kV/8kV<br>ESD Susceptibility Contact/Air Discharge: 8 kV/15kV | | | | |
| Surge protection | MGMT port: 4 kV<br>Service port: 10 kV<br>Power port: common mode 6 kV, differential mode 6 kV | | | | |
| Conformal coating | Protects circuits against moisture, salt spray, mold, electrical shock and leakage, and so on | | | | |

## Certifications and Regulatory Compliance

| Certifications and Regulatory Compliance | RG-CS85-24GT8XS-D | RG-CS85-24SFP/8GT8XS-D | RG-CS85-48GT4XS-D | RG-CS85-48SFP4XS-D | RG-CS85-48GT4XS-HPD |
|---|---|---|---|---|---|
| Safety regulation | IEC 62368-1 | | | | |
| EMC regulation | EN 300386, EN 55032 Class A, EN 55035,<br>EN IEC 61000-3-2, EN 61000-3-3, EN 61000-4-2, EN 61000-4-3,<br>EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-11 | | | | |

## Software Specifications

| RG-CS85 Series | |
|---|---|
| **Feature** | **Description** |
| Ethernet switching | Jumbo frame (maximum length: 9,216 bytes) |
| | IEEE 802.1Q (supporting 4K VLANs) |
| | Voice VLAN |
| | Super VLAN, Private VLAN |
| | MAC VLAN, Port based VLAN, Protocol based VLAN, IP-Subnet based VLAN |
| | GVRP |
| | Basic QinQ<br>Flexible QinQ |

| RG-CS85 Series | |
|---|---|
| **Feature** | **Description** |
| Ethernet switching | STP, RSTP, and MSTP |
| | ERPS (G.8032) |
| | LLDP/LLDP-MED |
| | LACP (IEEE 802.3ad) |
| IP service | ARP |
| | DHCP client, DHCP relay, and DHCP server |
| | DHCP snooping |
| | DNS |
| | DHCPv6 client and DHCPv6 relay |
| | DHCPv6 snooping |
| | Neighbor Discovery (ND) and ND snooping |
| IP routing | Static routing |
| | RIP and RIPng |
| | OSPFv2, OSPFv3, IS-ISv4, ISv4, and IS-ISv6 |
| | BGP4 and BGP4+ |
| | IPv4 and IPv6 VRF |
| | IPv4 and IPv6 PBR |
| Multicast | IGMP v1/v2/v3, and IGMP proxy |
| | IGMP v1/v2/v3 snooping |
| | PIM-DM, PIM-SM, and PIM-SSM |
| | MSDP |
| | MLD v1/v2 |
| | MLD snooping v1/v2 |
| | PIM-SMv6 and PIM-SSM v6 |
| MPLS | MPLS L3VPN |
| ACL and QoS | Standard IP ACLs<br>Extended IP ACLs<br>Extended MAC ACLs<br>Time-based ACLs<br>Expert-level ACLs<br>ACL80<br>IPv6 ACL |
| | ACL redirection |
| | Port traffic rate limiting |
| | Congestion management: RR, SP, WRR, DRR, WFQ, SP+WRR, SP+DRR, and SP+WFQ |
| | Congestion avoidance: tail drop, RED, and WRED |

| RG-CS85 Series | |
|---|---|
| **Feature** | **Description** |
| ACL and QoS | 802.1p/DSCP/ToS traffic classification<br>Eight priority queues per port |
| Security | Multiple AAA modes |
| | RADIUS and TACAS+ |
| | Port-based and MAC-based 802.1x authentication |
| Security | Web authentication |
| | HTTPS |
| | SSHv1, SSHv2 |
| | Global IP-MAC binding |
| | Port isolation and port security |
| | IP source guard |
| | SAVI |
| | CPP and NFPP |
| | Strict and loose RPF<br>uRPF ignoring default routes |
| Reliability | REUP, RLDP, DLDP |
| | IPv4 VRRP v2/v3 and IPv6 VRRP |
| | BFD |
| | Link tracing, fault notification, and remote loopback based on 802.3ah (EFM) |
| | Hot swapping of power modules and cables |
| | 3-level fan speed adjustment<br>Fan fault alarm |
| Device virtualization | Virtual Switching Unit (VSU) |
| NMS and maintenance | SPAN, RSPAN, and ERSPAN |
| | sFLOW |
| | NTP and SNTP |
| | FTP and TFTP |
| | SNMP v1/v2/v3 |
| | RMON (1, 2, 3, 9) |
| | NETCONF |
| | CWMP (TR-069) standard protocol |
| | gRPC |
| | Cloud and SON |
| PoE | IEEE 802.3af and 802.3at<br>Uninterruptible power supply upon hot start<br>Port priority |

# 05
# Protocol Compliance

| RG-CS85 Series | |
| --- | --- |
| **Organization** | **Standards and Protocol** |
| IETF | RFC 1058 Routing Information Protocol (RIP)<br>RFC 1157 A Simple Network Management Protocol (SNMP)<br>RFC 1305 Network Time Protocol Version 3 (NTP)<br>RFC 1349 Internet Protocol (IP)<br>RFC 1350 TFTP Protocol (revision 2)<br>RFC 1519 CIDR<br>RFC 1583 OSPF Version 2<br>RFC 1591 Domain Name System Structure and Delegation<br>RFC 1643 Ethernet Interface MIB<br>RFC 1757 Remote Network Monitoring (RMON)<br>RFC 1812 Requirements for IP Version 4 Router<br>RFC 1901 Introduction to Community-based SNMPv2<br>RFC 1902-1907 SNMP v2<br>RFC 1918 Address Allocation for Private Internet<br>RFC 1981 Path MTU Discovery for IP version 6<br>RFC 1997 BGP Communities Attribute<br>RFC 2131 Dynamic Host Configuration Protocol (DHCP)<br>RFC 2132 DHCP Options and BOOTP Vendor Extensions<br>RFC 2236 IGMP<br>RFC 2328 OSPF Version 2<br>RFC 2385 Protection of BGP Sessions via the TCP MD5 Signature Option<br>RFC 2439 BGP Route Flap Damping<br>RFC 2460 Internet Protocol, Version 6 Specification (IPv6)<br>RFC 2461 Neighbor Discovery for IP Version 6 (IPv6)<br>RFC 2462 IPv6 Stateless Address Auto configuration<br>RFC 2463 Internet Control Message Protocol for IPv6 (ICMPv6)<br>RFC 2545 Use of BGP 4 Multiprotocol Extensions for IPv6 Inter Domain Routing<br>RFC 2571 SNMP Management Frameworks<br>RFC 2711 IPv6 Router Alert Option<br>RFC 2787 Definitions of Managed Objects for the Virtual Router Redundancy Protocol<br>RFC 2863 The Interfaces Group MIB<br>RFC 2865 Remote Authentication Dial In User Service (RADIUS)<br>RFC 2918 Route Refresh Capability for BGP 4<br>RFC 2925 Definitions of Managed Objects for Remote Ping, Traceroute, and Lookup Operations (Ping only)<br>RFC 2934 Protocol Independent Multicast MIB for IPv4<br>RFC 3046 DHCP Option82<br>RFC 3065 Autonomous System Confederation for BGP<br>RFC 3101 OSPF Not so stubby area option<br>RFC 3137 OSPF Stub Router Advertisement sFlow<br>RFC 3417 (SNMP Transport Mappings)<br>RFC 3418 Management Information Base (MIB) for the Simple Network Management Protocol (SNMP)<br>RFC 3509 Alternative Implementations of OSPF Area Border Routers<br>RFC 3513 IP Version 6 Addressing Architecture<br>RFC 3575 IANA Considerations for RADIUS<br>RFC 3579 RADIUS Support For EAP<br>RFC 3623 Graceful OSPF Restart<br>RFC 3768 VRRP<br>RFC 3810 Multicast Listener Discovery Version 2 (MLDv2) for IPv6<br>RFC 3973 PIM Dense Mode<br>RFC 4022 MIB for TCP<br>RFC 4213 Basic Transition Mechanisms for IPv6 Hosts and Routers<br>RFC 4251 The Secure Shell (SSH) Protocol<br>RFC 4252 SSHv6 Authentication<br>RFC 4253 SSHv6 Transport Layer<br>RFC 4254 SSHv6 Connection<br>RFC 4271 A Border Gateway Protocol 4 (BGP 4)<br>RFC 4273 Definitions of Managed Objects for BGP 4 |

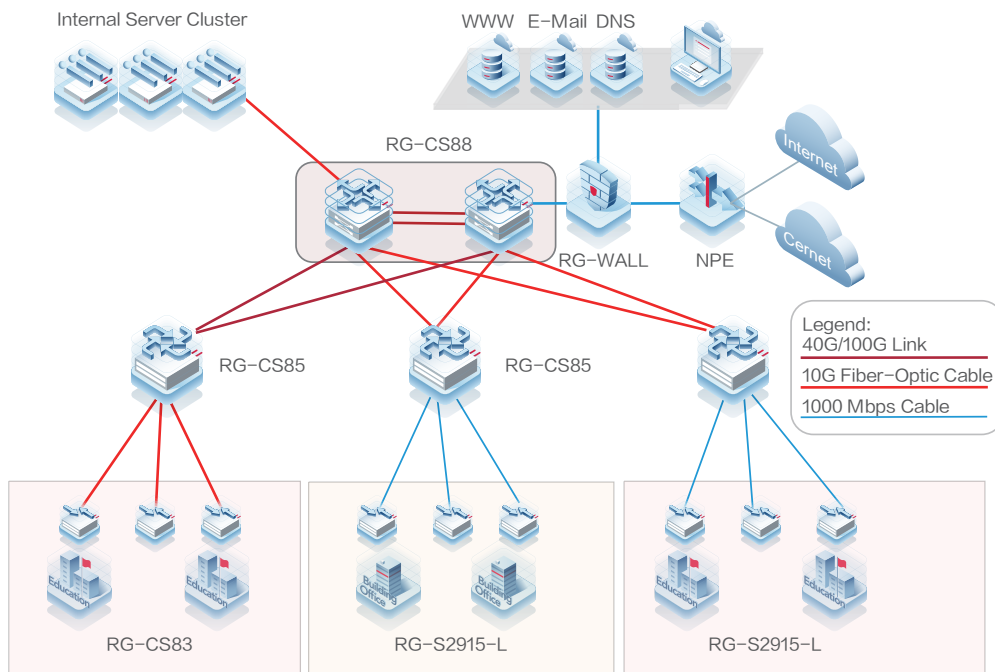| RG-CS85 Series | |
|---|---|
| **Organization** | **Standards and Protocol** |
| IETF | RFC 4291 IP Version 6 Addressing Architecture<br>RFC 4292 IP Forwarding Table MIB<br>RFC 4293 Management Information Base for the Internet Protocol (IP)<br>RFC 4360 BGP Extended Communities Attribute<br>RFC 4419 Key Exchange for SSH<br>RFC 4443 ICMPv6<br>RFC 4456 BGP Route Reflection: An Alternative to Full Mesh Internal BGP (IBGP)<br>RFC 4486 Subcodes for BGP Cease Notification Message<br>RFC 4552 Authentication/Confidentiality for OSPFv3<br>RFC 4601 PIM Sparse Mode<br>RFC 4607 Source Specific Multicast for IP<br>RFC 4724 Graceful Restart Mechanism for BGP<br>RFC 4750 OSPFv2 MIB partial support no SetMIB<br>RFC 4760 Multiprotocol Extensions for BGP 4<br>RFC 4861 IPv6 Neighbor Discovery<br>RFC 4862 IPv6 Stateless Address Auto configuration<br>RFC 4940 IANA Considerations for OSPF<br>RFC 5065 Autonomous System Confederation for BGP<br>RFC 5187 OSPFv3 Graceful Restart<br>RFC 5340 OSPFv3 for IPv6<br>RFC 5424 Syslog Protocol<br>RFC 5492 Capabilities Advertisement with BGP 4<br>RFC 5722 Handling of Overlapping IPv6 Fragments<br>RFC 5798 VRRP<br>RFC 5905 Network Time Protocol Version 4: Protocol and Algorithms Specification<br>RFC 6020 YANG - A Data Modeling Language for the Network Configuration Protocol (NETCONF)<br>RFC 6241 Network Configuration Protocol (NETCONF)<br>RFC 6620 FCFS SAVI<br>RFC 768 User Datagram Protocol (UDP)<br>RFC 783 TFTP Protocol (revision 2)<br>RFC 792 Internet Control Message Protocol (ICMP)<br>RFC 793 Transmission Control Protocol (TCP)<br>RFC 826 Ethernet Address Resolution Protocol (ARP)<br>RFC 854 Telnet Protocol Specification<br>RFC 959 File Transfer Protocol (FTP) |
| IEEE | IEEE 802.2 Logical Link Control<br>IEEE 802.1ab Link Layer Discovery Protocol<br>IEEE 802.1ad Provider Bridges<br>IEEE 802.1AX 2008 Link Aggregation<br>IEEE 802.1D Media Access Control (MAC) Bridges<br>IEEE 802.1D Spanning Tree Protocol<br>IEEE 802.1p Priority<br>IEEE 802.1p Traffic Class Expediting and Dynamic Multicast Filtering<br>IEEE 802.1Q Virtual Bridged Local Area Networks<br>IEEE 802.1s Multiple Spanning Tree Protocol<br>IEEE 802.1w Rapid Spanning Tree Protocol<br>IEEE 802.1x Port based network access control protocol<br>IEEE Std 802.3 CSMA/CD<br>IEEE Std 802.3ab 1000BASE-T specification<br>IEEE 802.3ad Link Aggregation Control Protocol (LACP)<br>IEEE Std 802.3ae 10GE WEN/LAN Standard<br>IEEE Std 802.3x Full Duplex and flow control<br>IEEE Std 802.3z Gigabit Ethernet Standard |

# 06
# Typical Applications

- The switches can be deployed at the aggregation layer of large-sized networks, the core layer of medium- and small-sized networks, the access layer of server groups, and Layer 3 access of all 1000 Mbps ports in large enterprises or office buildings in campuses.

- Each model of the series provides four to eight fixed 10GE optical ports to meet user requirements for smoothly upgrading uplinks connected to the backbone network to 10GE uplinks, maximizing the return on investment for users.

- Abundant security management mechanisms provide robust network security defense, high-security access control, and effective network access control.

- Sound management policies can be configured to manage bandwidth to guarantee the bandwidth required by key services such as voice, multicast audio and video services, and Video on Demand (VoD).

## Scenario 1

The RG-CS85 series switches serve as aggregation switches on a large-sized campus network. The switches provide high-performance 10GE bandwidth links from the aggregation layer to the core layer, and deliver higher bandwidth for access devices, to cope with increasing information amount of access users.

## Scenario 2

The RG-CS85 series switches serve as core switches on small- and medium-sized enterprise networks. The switches simplify the network architecture through VSU technology and substantially improves reliability and efficiency of the network system.
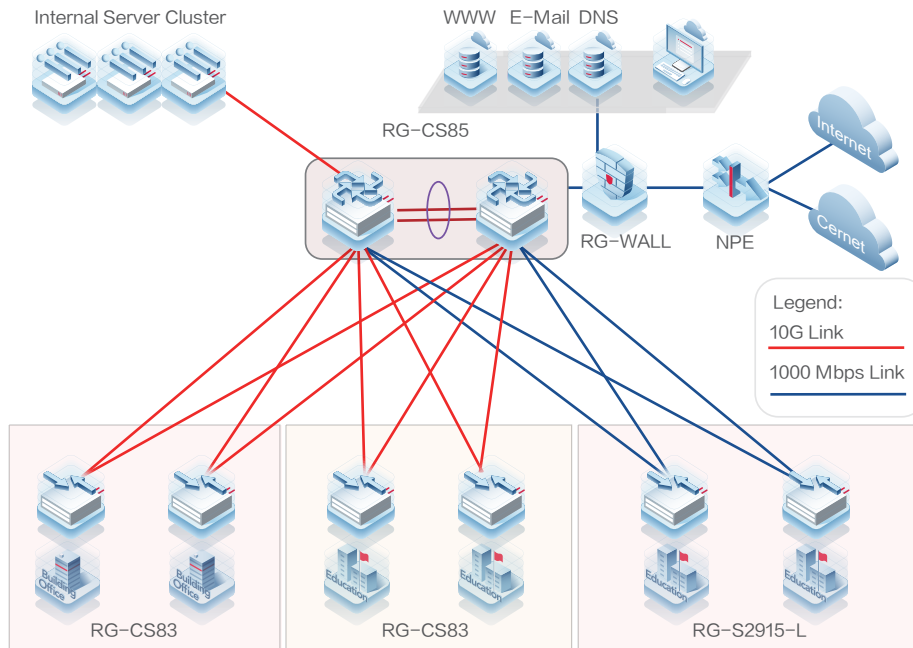


# 07
# Ordering Guide

Follow the steps to order the RG-CS85 series switches.

- Select a switch and expansion modules based on port requirements.
- Select power supply modules.
- Select optical transceivers based on port requirements.

# 08

# Ordering Information

## Switches and Power Modules

Order switches, expansion modules, power supply modules, and other components as needed. Before ordering an expansion module or power supply module, please contact our online customer service team for the latest support information about the module.

| Model | Description |
|---|---|
| RG-CS85-24GT8XS-D | 24 x 10/100/1000BASE-T ports, 8 x 1GE/10GE SFP+ ports, 1 x expansion slot, 3 x built-in fixed fans, 2 x power module slots (Purchase at least one RG-PA150IB-F module.) |
| RG-CS85-24SFP/8GT8XS-D | 24 x 1GE SFP ports (ports 1 to 16 are 100M/1GE SFP ports, ports 1 to 8 are 1GE SFP/RJ45 combo ports), 8 x 1GE/10GE SFP+ ports, 1 x expansion slot, 3 x built-in fans, 2 x power module slots (Purchase at least one RG-PA150IB-F module.) |
| RG-CS85-48GT4XS-D | 48 x 10/100/1000BASE-T ports, 4 x 1GE/10GE SFP+ ports, 1 x expansion slot, 3 x built-in fixed fans, 2 x power module slots (Purchase at least one RG-PA150IB-F module.) |
| RG-CS85-48SFP4XS-D | 48 x 1GE SFP ports, 4 x 1GE/10GE SFP+ ports, 1 x expansion slot, 3 x modular fans, 2 x power module slots (Purchase at least one RG-PA150IB-F module.) |
| RG-CS85-48GT4XS-HPD | 48 x 10/100/1000BASE-T ports, 4 x 1GE/10GE SFP+ ports, 1 x expansion slot, 2 x modular fans, 2 x power module slots (Purchase at least one RG-PA600I-P-F/RG-PA1000I-P-F module.) |
| CM85-4XS2CQ | Expansion module, 4 x 1GE/10GE SFP+ ports and 2 x 40GE/100GE QSFP28 ports |
| RG-PA150IB-F | 150 W AC power module |
| RG-PA600I-P-F | 600 W AC power module |
| RG-PA1000I-P-F | 1000 W AC power module |

Note:
- 8 x 1GE/10GE SFP+ ports, 4 x 1GE/10GE SFP+ ports support 1GE SFP transceivers and 10GE SFP+ transceivers.
- 2 x 40GE/100GE QSFP28 ports support 40GE QSFP+ transceivers and 100GE QSFP28 transceivers.

## Optical Transceivers and Cables

### 1GE

| Model | Description |
|---|---|
| Mini-GBIC-GT | 1000BASE-X to 1000BASE-T, copper SFP transceiver, RJ45, 100 m over Cat 5e/6/6a<br>The port needs to be configured with auto-negotiation |
| MINI-GBIC-SX-MM850 | 1000BASE-SX, SFP transceiver, 850 nm, Duplex LC, 500 m over MMF |
| MINI-GBIC-LX-SM1310 | 1000BASE-LX, SFP transceiver, 1310 nm, Duplex LC, 10 km over SMF |
| MINI-GBIC-LH40-SM1310 | 1000BASE-LH, SFP transceiver, 1310 nm, Duplex LC, 40 km over SMF |
| MINI-GBIC-ZX80-SM1550 | 1000BASE-ZX, SFP transceiver, 1550 nm, Duplex LC, 80 km over SMF |
| GE-SFP-LX20-SM1310-BIDI | 1000BASE-LX, SFP transceiver, Tx1310/Rx1550, BiDi LC, 20 km over SMF |
| GE-SFP-LX20-SM1550-BIDI | 1000BASE-LX, SFP transceiver, Tx1550/Rx1310, BiDi LC, 20 km over SMF |

| Model | Description |
|---|---|
| GE-SFP-LH40-SM1310-BIDI | 1000BASE-LH, SFP transceiver, Tx1310/Rx1550, BiDi LC, 40 km over SMF |
| GE-SFP-LH40-SM1550-BIDI | 1000BASE-LH, SFP transceiver, Tx1550/Rx1310, BiDi LC, 40 km over SMF |

Note: BiDi transceivers must be used in pairs. If one end uses GE-SFP-LX20-SM1310-BIDI, the other end must use GE-SFP-LX20-SM1550-BIDI.

## 10GE

| Model | Description |
|---|---|
| XG-SFP-SR-MM850 | 10GBASE-SR, SFP+ transceiver, 850nm, Duplex LC, 300 m over MMF |
| XG-SFP-LR-SM1310 | 10GBASE-LR, SFP+ transceiver, 1310nm, Duplex LC, 10 km over SMF |
| XG-SFP-ER-SM1550 | 10GBASE-ER, SFP+ transceiver, 1550nm, Duplex LC, 40 km over SMF |
| XG-SFP-AOC1M | 10GBASE, SFP+ active optical cable (AOC), 1 m, including one cable and two optical transceivers |
| XG-SFP-AOC3M | 10GBASE, SFP+ active optical cable (AOC), 3 m, including one cable and two optical transceivers |
| XG-SFP-AOC5M | 10GBASE, SFP+ active optical cable (AOC), 5 m, including one cable and two optical transceivers |

## 40GE

| Model | Description |
|---|---|
| 40G-QSFP-SR-MM850 | 40GBASE-SR, QSFP+ transceiver, 850 nm, MPO 1 x 12, 150 m over OM4 MMF, 100 m over OM3 MMF |
| 40G-QSFP-LSR-MM850 | 40GBASE-LSR, QSFP+ transceiver, 850 nm, MPO 1 x 12, 400 m over OM4 MMF, 300 m over OM3 MMF |
| 40G-QSFP-LR4-SM1310 | 40GBASE-LR4, QSFP+ transceiver, 1310 nm, Duplex LC, 10 km over SMF |
| 40G-QSFP-iLR4-SM1310 | 40GBASE-iLR4, QSFP+ transceiver, 1310 nm, Duplex LC, 2 km over SMF |
| 40G-QSFP-LX4-SM1310 | 40GBASE-LX4, QSFP+ transceiver, 1310 nm, Duplex LC, 150 m over OM3/OM4 MMF, 2 km over SMF |
| 40G-AOC-5M | 40GBASE, QSFP+ active optical cable (AOC), 5 m, including one cable and two optical transceivers |
| 40G-AOC-30M | 40GBASE, QSFP+ active optical cable (AOC), 30 m, including one cable and two optical transceivers |

## 100GE

| Model | Description |
|---|---|
| 100G-QSFP-SR-MM850 | 100GBASE-SR, QSFP28 transceiver, 850 nm, MPO 1 x 12, 100 m over OM4 MMF, 70 m over OM3 MMF |
| 100G-QSFP-LR4-SM1310 | 100GBASE-LR4, QSFP28 transceiver, 1310 nm, Duplex LC, 10 km over SMF |
| 100G-QSFP-iLR4-SM1310 | 100GBASE-iLR4, QSFP28 transceiver, 1310 nm, Duplex LC, 2 km over SMF |
| 100G-AOC-5M | 100GBASE, QSFP28 active optical cable (AOC), 5 m, including one cable and two optical transceivers |
| 100G-AOC-10M | 100GBASE, QSFP28 active optical cable (AOC), 10 m, including one cable and two optical transceivers |

# 09
## Package Contents

| Item | RG-CS85-24GT8XS-D | RG-CS85-24SFP/8GT8XS-D | RG-CS85-48GT4XS-D | RG-CS85-48GT4XS-HPD | RG-CS85-48SFP4XS-D |
|---|---|---|---|---|---|
| Chassis | 1 | 1 | 1 | 1 | 1 |
| Grounding wire | 1 | 1 | 1 | 1 | 1 |
| Mounting bracket | 2 | 2 | 2 | 2 | 2 |
| Rubber pad | 4 | 4 | 4 | 4 | 4 |
| Cross recessed countersunk head screw, M4x8, GB819-85 | 8 | 8 | 8 | 8 | 8 |
| Mounting Bracket Installation Guide | 1 | 1 | 1 | 1 | 1 |
| Warranty Manual and Network Product Hazardous Substance Statement | 1 | 1 | 1 | 1 | 1 |
| Ruijie Networks Convergence Product Management Software | 1 (pre-installed) | 1 (pre-installed) | 1 (pre-installed) | 1 (pre-installed) | 1 (pre-installed) |
| Shipping dimensions (W x D x H) | 593 mm x 497 mm x 192 mm (23.35 in. x 14.57 in. x 7.56 in.) | | | 563 mm x 563 mm x 210 mm (22.17 in. x 22.17 in. x 8.27 in.) | |
| Shipping weight | 6.20 kg (13.67 lbs) | 6.62 kg (14.59 lbs) | 6.30 kg (13.89 lbs) | 7.80 kg (17.20 lbs) | 7.70 kg (16.98 lbs) |

# 10
## Warranty

For more information about warranty terms and period, contact your local sales agency:

• Warranty terms: https://www.ruijienetworks.com/support/servicepolicy

• Warranty period: https://www.ruijienetworks.com/support/servicepolicy/Service-Support-Summary/

Note: The warranty terms are subject to the terms of different countries and distributors.

# 11
# More Information

For more information about Ruijie Networks, visit the official Ruijie website or contact your local sales agency:

- Ruijie Networks official website: https://www.ruijienetworks.com/
- Online support: https://www.ruijienetworks.com/support
- Hotline support: https://www.ruijienetworks.com/support/hotline
- Email support: service_rj@ruijienetworks.com

Ruijie Networks Co., Ltd
Website: https://www.ruijienetworks.com