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## 1. Summary

The ZEQUO 2300 is a Layer 2 all giga switching hub equipped with management functions that has 28 10/100/1000BASE-T ports and 4 SFP expansion ports.

## 2. Feature

- (1) Ports 1 to 28 are 10BASE-T/100BASE-TX/1000BASE-T ports corresponding to auto negotiation. Also their speed and communication mode can be switched by configuration. However, ports 25 to 28 do not support half-duplex mode.
- (2) Ports 25 to 28 are SFP+ extension slots. These ports and the 1000BASE-T twisted pair cable ports cannot be used simultaneously.
- (3) Settings and firmware can be changed and saved by using an SD card.
- (4) All twisted pair ports support straight/cross cable auto sensing function. Simply connect devices with straight cables, whether it is a terminal or a network device. (To prevent loop failures, ports 1 to 24 are fixed to MDI-X at factory default settings.)
- (5) The connection status for each port is detected by the power saving mode, and it can suppress the power consumption to required volumes when not linked up. (Factory default: deactivated)
- (6) Due to the loop detection/shutoff function, a port where loop has occurred can be automatically shut off to prevent loop failures. When a port is shut off and recovered automatically, SNMP trap can be sent to notify the incident to the administrator. Moreover, the port with a loop can be identified by loop notification on the LEDs on the main unit and referring the history of loop on the setting screen.
- (7) The IEEE802.1p compatible QoS function is supported.
- (8) Equipped with energy efficient Ethernet (EEE) conforming to IEEE802.3az (LPI). When there is no data transmission at link up, the energy-saving state automatically starts so that power consumption can be reduced on each port.
- (9) Supports triple authentication that can simultaneously wait on IEEE802.1X authentication, MAC authentication, and WEB authentication via one port, and an authentication network which is matched to the kinds of connection terminals can be constructed.
- (10) Equipped with step authentication functions, and can prevent illegal access of the terminals.
- (11) The Ring Redundant Protocol (RRP) is supported, allowing to make a redundant network via ring topology.

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### 3. Rated/Environmental Conditions

3-1. Power supply	AC100-240V, 50/60Hz, 0.6A (with a built-in power supply)
3-2. Power consumption	Normally, Max.22.4W, Min.11.6W
3-3. Operating environment	Temperature: 0 - 50°C Humidity: 20 - 80%RH (no condensation)
3-4. Storage environment	Temperature: -20 - 70°C Humidity: 10 - 90%RH (no condensation)
3-5. EMC compliance	CISPR 32 Class A EN 55032 Class A AS/NZS CISPR32 Class A VCCI Class A EN 61000-3-2, EN 61000-3-3 EN 55024 IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11
3-6. Safety compliance	IEC 62368-1 EN 62368-1
3-7. Environment compliance	RoHS compliant

### 4. Form

4-1. Form and materials/colors	Dimensions : 44mm (Height) × 440mm (Width) × 312mm (Depth) (Excluding protruding sections) Case material : Main unit: SECC, Front face: PC/ABS, Face plate: PC Color : Main unit: Green 03, Front face: Black 02, Face plate label: Black 01
4-2. Mass (Weight)	3,900 g

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## 5. Hardware Specifications

5-1. Interface	<p>Twisted pair port 1-24 : RJ45 connector (*1)  Transmitting and receiving network system :  IEEE802.3 10BASE-T  IEEE802.3u 100BASE-TX  IEEE 802.3ab 1000BASE-T</p> <p>Energy Efficient Ethernet (*2) : IEEE802.3az (LPI)  Transmission speed : 10/100Mbps full/half duplex,  1000Mbps full duplex.</p> <p>Compatible cable : Twisted pair cable  (At least equivalent to EIA/TIA568 category 5e)</p> <p>Maximum transmission distance : 100m  Auto-Negotiation : Communication speed and full/half duplex are automatically recognized.  The setting can be fixed to 10Mbps, 100Mbps and full duplex or half duplex.</p> <p>Twisted pair port 25-28 : RJ45 connector  Transmitting and receiving network system :  IEEE802.3 10BASE-T  IEEE802.3u 100BASE-TX  IEEE802.3ab 1000BASE-T</p> <p>Transmission speed : 10/100/1000Mbps full duplex,  Compatible cable : Twisted pair cable  (At least equivalent to EIA/TIA568 category 5e)</p> <p>Maximum transmission distance : 100m  Auto-Negotiation : Communication speed and full/half duplex are automatically recognized.  The setting can be fixed to 10Mbps, 100Mbps and full duplex.</p> <p>*1 Embedded power saving mode detects the connection status automatically and saves power consumption to minimum.  *2 Energy Efficient Ethernet (EEE) conforming to IEEE802.3az (LPI).  When there is no data transmission at link up, the energy-saving state automatically starts so that power consumption can be reduced on each port.</p> <p>SFP+ extension slot 25-28  Transmitting and receiving network system: IEEE802.3z 1000BASE-X  * Select either of RJ45 or SFP for use  SFF-8472 (DMI: Diagnostic Monitoring Interface)  * Optional Accessories : 1000BASE-SX SFP Module(i) (PN54022-ID)  1000BASE-LX SFP Module(i) (PN54024-ID)</p>
5-2. Switching mode	<p>Switching method : Store and Forward  Switching capacity : 56.0Gbps  Packet transfer capability : Non-blocking  Max 1,488,000pps/port (1000Mbps)  Max 148,800pps/port (100Mbps)  Max 14,880pps/port (10Mbps)</p> <p>MAC Address table : Max 16K entry/unit  Buffer memory : 2.0M Bytes/unit  Flow control : half-duplex Back pressure  full-duplex IEEE802.3x</p> <p>Aging timeout : 10 to 1,000,000 sec. (Default: 300 sec.)  Jumbo frame supported : 9KB  Transmittable frames : EAP,BPDU,LACP  HOL Blocking Prevention : Support</p>

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## 5. Hardware Specifications

5-3. Terminal emulator connection	Console port : RJ45 connector 1 port Transmission mode : RS-232C (ITU-TS V.24) Emulation mode : VT100 Communication configuration : 9,600bps, 8bit, None Parity control, Stop bit 1 bit
5-4. SD card slot	SD card slot : 1 Standard : SD/SDHC Class : 2/4/6/10 Size : 128MBytes to 32GBytes
5-5. LED display	<p>(1) POWER LED</p> Green Light : Power is ON Off : Power is OFF. Or, an internal power fault. <p>(2) STATUS LED</p> Green Light : The system is normally operating. Green Blink : Port is available within 3 days after a loop resolution. Orange Light : Starting. Orange Blink : Malfunction (Contact the seller). <p>(3) SD CARD LED</p> Green Light : SD card inserted Green Blink : Reading / writing data Orange Light : SD card error Off : No SD card <p>(4) Port LED (Port 1-28)</p> Green Light : Link is established at 10/100/1000 Mbps. Green Blink : Transmitting and receiving data at 10/100/1000 Mbps. Orange Light : Shuts off due to loop detection and shutoff functions/ storm controls/BPDU guard Orange Blink : Transmitting and receiving just the administration packets Off : No devices is connected. <p>(5) Port LED (SFP port 25-28)</p> Green Light : Link is established at 1000 Mbps full duplex. Green Blink : Transmitting and receiving data at 1000 Mbps full duplex. Orange Light : Shuts off due to loop detection and shutoff functions/ storm controls/BPDU guard Orange Blink : Transmitting and receiving just the administration packets Off : No devices is connected.
5-6. Cascade connections	Port 1-28 corresponding to the Auto MDI / MDI-X (Allowed change by the setting for the application) The factory default is for ports 1 to 24 are fixed to be MDI-X.
5-7. FAN	No installed

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## 6. Software Specifications

6-1. Configuration	Control parameters can be set by the following procedures: (1) Configuration from an asynchronous terminal connected to the console port. (2) Configuration from a remote terminal connected via TELNET and SSH. (3) It can be set from a remote terminal according to the Web screen.
6-2. Switching Hub Control	ZEQUO assist Plus can confirm the management/operation status of Switching Hub.  Switching Hub can be controlled by the following procedures: (1) Control from an asynchronous terminal connected to the console port. (2) Control from a remote terminal using SSH/TELNET and TCP/IP network connection. (3) Control using SNMP Manager The switching Hub operation status can be checked using the following functions. (1) Internal temperature sensor function (2) Function to display the CPU usage and memory usage (3) SFP module status checking function (DDM: Digital Diagnostic Monitoring) (4) Twisted pair cable diagnostic function
6-3. System reboot	The system can be reset from the software in the following three modes: (1) Warm start. (2) Reset back to the factory default settings.
6-4. Agent	Management protocol : SNMP v1/v2c/v3 (RFC 1157, RFC 1901, RFC 1908, RFC 3411, RFC 3414) TELNET (RFC 854) SSH v2 (RFC 4251, RFC 4252, RFC4253, RFC 4254) SNTPv3 (RFC 1769) Data transfer protocol : TFTP (RFC 783, RFC 1350)
6-5. Support MIB	RFC1213-MIB (MIB II) (RFC 1213) (※1) BRIDGE-MIB (RFC 4188) (※2) SNMPv2-MIB (RFC 1907) RMON-MIB (RFC 2819) only etherStatsTable SNMP-FRAMEWORK-MIB (RFC 2571) SNMP-MPD-MIB (RFC 2572) SNMP-NOTIFICATION-MIB (RFC 2573N) SNMP-TARGET-MIB (RFC 2573T) SNMP-USER-BASED-SM-MIB (RFC 2574) SNMP-VIEW-BASED-ACM-MIB (RFC 2575) SNMP-COMMUNITY-MIB (RFC 2576) IP MIB (RFC 4293) (※3) IF-MIB (RFC 2863) excluding IfMIB IEEE8021-PAE-MIB excluding dot1xPaeSupplicant  *1 Excluding following item At , ipRouteTable, icmp, egp *2 Excluding following item dot1dStp, dot1dSr, dot1dStatic *3 Excluding following item ipDefaultRouterTable, ipv6RouterAdvertTable
6-6. Log	Maximum number to be kept: 10,000 Transfers system logs to the Syslog server (IPv4 / v6)

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## 6. Software Specifications

6-7. Loop Detection	<p>Will be notified of the ports which generated the loops via LEDs, those ports will be automatically blocked off. (When blocked off, the port LEDs light up orange.) In addition, when ports are blocked off and automatically restored, the administrator can be notified via an SNMP trap. After loop cancellations, for the ports that are within three days, the STATUS LEDs will flash green, and notifications will be given.</p> <ul style="list-style-type: none"> <li>· Loop detection port <ul style="list-style-type: none"> <li>Enabled: Ports 1 to 24</li> <li>Disabled: Ports 25 to 28 (factory default)</li> </ul> </li> <li>· Loop detection setting <ul style="list-style-type: none"> <li>Enabled (factory default)</li> <li>Enabled/disabled can be switched by configuring a setting using the console.</li> </ul> </li> <li>· Loop shutoff time <ul style="list-style-type: none"> <li>60 to 86,400 sec. (factory default: 60 sec.)</li> <li>The set time Port LED lights up orange and the port shuts off.</li> </ul> </li> <li>· Loop history retention time <ul style="list-style-type: none"> <li>3 days</li> <li>The LOOP HISTORY LED blink for three days.</li> <li>The Port LED also remains lit for three days after the loop is eliminated.</li> </ul> </li> </ul> <p>The Loop shutoff mode has the following 2 types of modes.</p> <ul style="list-style-type: none"> <li>· Blocking mode (factory default) <ul style="list-style-type: none"> <li>When loops are detected, the ports are blocked, and just the loop detection packets will be transmitted and received.</li> </ul> </li> <li>· Shutdown mode <ul style="list-style-type: none"> <li>When loops are detected, the ports are shut down, and none of the packets including the loop detection packets will be transmitted nor received. (*)</li> <li>*Just the loop detection packets from 30 seconds before the set restoration times will automatically be transmitted and received.</li> </ul> </li> </ul>
6-8. Others	<p>Syslog Client (system log sent to a Syslog server) TFTP Client (Firmware upgrade, save and read of configuration information) TELNET Client DHCP Client SNTP LLDP LLDP-MED DNS Resolver DHCP Snooping UDLD DDM Statistics Watch Dog Timer</p>

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## 7. Layer 2 Switching Functions

7-1. Spanning Tree	IEEE 802.1D Spanning Tree Protocol, Rapid Spanning Tree Protocol IEEE 802.1s Multiple Spanning Tree Protocol BPDU guard
7-2. VLAN	IEEE802.1Q Private VLAN MAC-based VLAN Subnet based VLAN Protocol-based VLAN Asymmetric VLAN Voice VLAN (LLDP-MED) Dynamic VLAN Guest VLAN Number of VLAN registrations: 4,094 (including default)
7-3. Link aggregation	IEEE802.3ad link aggregation function (LACP/STATIC) Up to 14 groups can be created (up to 8 ports per group).
7-4. SPAN, RSPAN	Subject port traffic can be copied and transmitted to designated ports (multiple subject ports can be designated) Remote switching packets can be monitored via RSPAN
7-5. Multicast	IGMP snooping (IGMPv1/v2/v3) function. (can be up to 1,024 groups of registration) IGMP Querier function MLD snooping (MLDv1/v2) function. (can be up to 1,024 groups of registration,) Multicast filtering function
7-6. QoS	IEEE802.1p 8 levels of Priority Queue supported Scheduling Method: Strict Priority Queuing (SPQ: Strict priority queuing ) Weighted Round Robin (WRR: Weighted round robin scheduling ) Weighted Deficit Round Robin (WDRR: Weighted Deficit Round Robin scheduling)
7-7. Authentication Function	IEEE802.1X Port-based authentication Mac-based authentication using IEEE 802.1X Dynamic VLAN function using IEEE 802.1X Guest VLAN using IEEE 802.1X (EAP-MD5/TLS/PEAP Authentication method) Force Authorized MAC Address Configuration EAP Packet Forwarding function (Enable/disable EAP transmission can be specified for each port.) MAC authentication WEB authentication Triple authentication (*1) Step authentication (*2) *1 IEEE802.1X MAC-based/MAC/WEB authentication can be simultaneously put into standby via 1 port *2 2 authentications can be combined in phases MAC-WEB authentication MAC-802.1X authentication 802.1X-WEB authentication
7-8. Access Control	Access control can be controlled by the following parameters: (1) IP address (Source or Destination) (2) IPv6 address (Source or Destination) (3) MAC address (Source or Destination) (4) TCP/UDP port number (Source or Destination) (5) VLAN ID (6) IEEE 802.1p Priority (7) DSCP (8) Protocol (9) ICMP type (10) TCP SYN Flag

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## 7. Layer 2 Switching Functions

7-9. Ring protocol	Redundancy is enabled by ring topology. (Up to 8 group can be registered.)
7-10. Time setting	SNTP settings, time manual setting
7-11. Storm control function	Unknown unicast, Broadcast, Multicast of possible control the storm

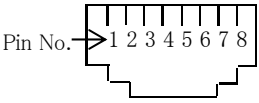
## 8. Web management function

8-1. Software specification																																			
8-1-1. Enabled browser	Microsoft Internet Explorer 11																																		
8-2. Setting function																																			
8-2-1. Switching configuration	<table border="0"> <tr> <td>Administration Configuration</td> <td>Authentication Configuration</td> </tr> <tr> <td>IP Address Configuration</td> <td>IGMP Snooping Configuration</td> </tr> <tr> <td>SNMP Configuration</td> <td>IGMP Querier Configuration</td> </tr> <tr> <td>SNTP Configuration</td> <td>Loop Detection Configuration</td> </tr> <tr> <td>Port Configuration</td> <td>Ring protocol Configuration</td> </tr> <tr> <td>System Security Configuration</td> <td>DDM Configuration</td> </tr> <tr> <td>ID/Password Change</td> <td>Port counter Configuration</td> </tr> <tr> <td>Forwarding Database(FDB) Configuration</td> <td>Configuration File Transfer</td> </tr> <tr> <td>Time(SNTP) Configuration</td> <td>Reboot</td> </tr> <tr> <td>LLDP Configuration</td> <td>Syslog Transmission Configuration</td> </tr> <tr> <td>VLAN Configuration</td> <td>Save Settings</td> </tr> <tr> <td>Link Aggregation Configuration</td> <td></td> </tr> <tr> <td>Port monitoring Configuration</td> <td></td> </tr> <tr> <td>MSTP (Multiple Spanning Tree)</td> <td></td> </tr> <tr> <td>Access control Configuration</td> <td></td> </tr> <tr> <td>QoS Configuration</td> <td></td> </tr> <tr> <td>Storm Control Configuration</td> <td></td> </tr> </table>	Administration Configuration	Authentication Configuration	IP Address Configuration	IGMP Snooping Configuration	SNMP Configuration	IGMP Querier Configuration	SNTP Configuration	Loop Detection Configuration	Port Configuration	Ring protocol Configuration	System Security Configuration	DDM Configuration	ID/Password Change	Port counter Configuration	Forwarding Database(FDB) Configuration	Configuration File Transfer	Time(SNTP) Configuration	Reboot	LLDP Configuration	Syslog Transmission Configuration	VLAN Configuration	Save Settings	Link Aggregation Configuration		Port monitoring Configuration		MSTP (Multiple Spanning Tree)		Access control Configuration		QoS Configuration		Storm Control Configuration	
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8-3. Monitoring function																																			
8-3-2. Learning and recording information	FDB table, ARP table, Statistics, System log																																		
8-4. System management tools	Software upgrade, Reboot, Save current config, Config file transfer, Ping execution																																		

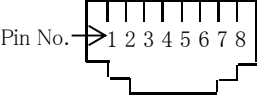
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## 9. Connector Pin Arrangement

9-1. Port 1 - 28										
Status	Pin No.	1	2	3	6	4	5	7	8	
MDI-X	Signal	BL_DB+	BL_DB-	BL_DA+	BL_DA-	BL_DD+	BL_DD-	BL_DC+	BL_DC-	
MDI	Signal	BL_DA+	BL_DA-	BL_DB+	BL_DB-	BL_DC+	BL_DC-	BL_DD+	BL_DD-	

9-2. Console port				
Pin No.	Signal	Pin No.	Signal	
1	NC	5	GND	
2	NC	6	RXD	
3	TXD	7	NC	
4	GND	8	NC	

## 10. Installation Procedures and Accessories

10-1. Installation Procedures	Mounting to rack
10-2. Accessories	<ul style="list-style-type: none"> <li>(1) Installation Guide : 1</li> <li>(2) CD-ROM (PDF version of Operating Instructions, ZEQUO assist Plus) (*1) : 1</li> <li>(3) Rubber foot : 4</li> <li>(4) Mounting bracket (for 19-inch rack) : 2</li> <li>(5) Screw (for 19-inch rack) : 4</li> <li>(6) Screw (for fixing the main unit and the mounting bracket) : 8</li> <li>(7) Dummy SD card : 1</li> <li>(8) Power cord (CEE7/7) (*2) : 1</li> </ul> <p>*1 We discontinued the CD-ROM from October 2020's production lots.            *2 The attached power cord is dedicated for AC 100 - 240 V use.</p>

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## 11. Optional accessories

<p>11-1. 1000BASE-SX SFP Module (i) (Model No. :PN54022-ID)</p>	<p>Fiber optic port connector type : LC connector (Duplex) Standards : IEEE802.3z 1000BASE-SX Transmission speed : 1000Mbps, full duplex Compatible cable : Fiber cable 50/125 <math>\mu</math> m Multi Mode Fiber 62.5/125 <math>\mu</math> m Multi Mode Fiber Maximum transmission distance : 550 m at 50/125 <math>\mu</math> m 220 m at 62.5/125 <math>\mu</math> m Operating Temperature : 0 - 60°C</p>
<p>11-2. 1000BASE-LX SFP Module (i) (Model No. :PN54024-ID)</p>	<p>Fiber optic port connector type : LC connector (Duplex) Standards : IEEE802.3z 1000BASE-LX Transmission speed : 1000Mbps, full duplex Compatible cable : Fiber cable 10/125 <math>\mu</math> m Single Mode Fiber 50/125 <math>\mu</math> m Multi Mode Fiber 62.5/125 <math>\mu</math> m Multi Mode Fiber Maximum transmission distance : 10 km when Single Mode Fiber is used 550 m when Multi Mode Fiber is used Operating Temperature : 0 - 60°C</p>

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## 12. Prohibitions when Using the Product to Guarantee Safety

Denotes that “Death or serious injuries might be sustained”.

The manufacturer assumes no responsibility for any problems occurring when the following conditions are not satisfied. Observe the following items when using the product.

- (1) Do not use power supply other than AC 100 - 240 V.  
Deviation could lead to fire, electric shock, and/or equipment failure.
- (2) Do not handle this Switching Hub and connection cables during a thunderstorm.  
Deviation could lead to electric shock.
- (3) Do not disassemble and/or modify this Switching Hub.  
Deviation could lead to fire, electric shock, and/or equipment failure.
- (4) Do not damage the power cord. Do not bend too tightly, stretch, twist, bundle with other cord, pinch, put under a heavy object and/or heat it.  
Damaged power cord could lead to fire, short, and/or electric shock.
- (5) Do not unplug nor plug in the power plug with wet hands.  
Deviation could lead to electrical shock, and/or equipment failure.
- (6) Do not insert, nor drop any foreign objects such as metal or readily combustible things into the inside through the openings.  
Deviation could lead to fire, electric shock, and/or equipment failure.
- (7) Do not store or use the Switching Hub in places where it might get splashed with liquids such as water, in places with a lot of humidity, in places with conductive dust, or in places where there are corrosive and combustible gases.  
Deviation could lead to fire, electrical shock, and/or equipment failure.
- (8) Do not use the Switching Hub in dusty environments such as on floors, underneath floors, the backside of ceilings, or boards. Do not use the Switching Hub in very dusty areas such as on floors, underneath floors, the backside of ceilings, or boards.  
Deviation could lead to fire, electrical shock, and/or equipment failure. It is recommended that the Switching Hub be operated in environments such as the inside of racks where it is difficult for dust to be generated.
- (9) Do not store or use the Switching Hub in places where it will be exposed to direct sunlight or high temperatures.  
The temperature inside will rise, which may cause fire.
- (10) Do not store or use the Switching Hub in places where there are lots of vibrations and impacts, or in unstable areas.  
It might fall, which may cause injuries and/or equipment failure.
- (11) Do not put the Switching Hub into fire.  
Deviation could lead to explosion and/or fire.
- (12) Do not connect any other devices except for 10BASE-T/100BASE-TX/1000BASE-T devices to the twisted pair ports.  
Deviation could lead to equipment failure.
- (13) Do not insert any other modules except for our optional SFP module (PN54022-SG/PN54024-SG) to the SFP extension slots.  
Check out our website for the latest information on supported SFP modules.

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### 13. Cautions when Using the Product to Guarantee Safety

Denotes that “Minor injuries might be sustained, or property damage might occur”.

The manufacturer assumes no responsibility for any problems occurring when the following conditions are not satisfied. Observe the following items when using the product.

- (1) Be sure to check the precautions which are printed on the product labels before using.  
Deviation could lead to electric shock.
- (2) Use the bundled power cord (AC 100 - 240 V specifications).  
Deviation could lead to electric shock, malfunction, and/or equipment failure.
- (3) Unplug the power cord in case of equipment failure.  
Deviation, such as keeping connected for a long time, could lead to fire.
- (4) Be sure to connect the ground cable.  
Otherwise this might cause electrical shocks, misoperations and malfunctions.  
Connect the Switching Hub via the supplied power cord to the outlet which is connected to the ground.  
If the outlet is not connected to a ground, connect the ground cable to the ground terminal screw.
- (5) Connect the power cord firmly to the power port.  
Deviation could lead to electric fire, shock, and/or malfunction.
- (6) If the STATUS LED is blinking orange, check for the cause via the system log, since it might be a malfunction if it is not the temperature, loop detection and shutoff, unplug the power plug.  
Deviation, such as keeping connected for a long time, could lead to fire.
- (6) Handle the Switching Hub carefully so that fingers or hands may not be damaged by twisted pair port, SFP extension slot, console port, SD card slot, or power cord hook block.
- (7) Check whether the optical fiber cable connectors are contaminated with dust, etc.  
This might cause the optical signal to not be transmitted normally, and cause misoperations and malfunctions. If they are contaminated, make sure to clean them off, then connect them to the optical fiber ports.
- (8) This Switching Hub is to be periodically serviced in order to maintain its performance.  
Please choose a product administrator, and have them be sure to implement periodic maintenance. When doing maintenance, check the inspection chart that is posted on our website which has the requisite items listed on it.
- (9) When using this Switching Hub to design systems, use it after applying appropriate measures such as setting up redundant configurations.  
Communications failures might be generated due to causes such as malfunctions or misoperations while the Switching Hub is being used.
- (10) When using this Switching Hub for applications which require extremely high reliability, be careful to expend all possible means to ensure safety and reliability.  
This Switching Hub was not designed nor manufactured with the intention that it be used for applications (in use with railways, aviation, and medical care, etc. whereas the influence rate due to communications failures is extremely high in regard to systems that directly affect systems and human lives) which require extremely high reliability.
- (11) It is recommended that this Switching Hub be replaced about five years after it has been installed.  
This may vary depending upon conditions such as utilisation rates and usage environments, but performance might decrease due to the age-related degradation, etc. of components.
- (12) Be careful in regards to environmental restrictions whereby the Switching Hub can be used.  
Please isolate the business power lines and communications lines. Isolate distribution lines and other distribution lines, and low current power lines, optical fiber cables, metallic water conduits, and gas conduits, etc. Noise may be generated in the communications lines which might cause communications glitches.
- (13) Do not connect the console ports with any other device except for serial communication terminal.  
Deviation could lead to equipment failure.

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#### 14. Basic Instructions for the Use of This Product

- (1) For inspection and/or repair, consult the shop.
- (2) Use commercial power supply from a wall socket, which is close and easily accessible to this Switching Hub.
- (3) Unplug the power cord when installing or moving this Switching Hub.
- (4) Unplug the power cord when cleaning this Switching Hub.
- (5) Use this Switching Hub within the specifications. Deviation could lead to malfunction.
- (6) Do not touch the metal terminal of the RJ45 connector, the modular plug of connected twisted pair cable, or the metal terminal of the SFP extension slot. Do not place charged objects in the proximity of them. Static electricity could lead to equipment failure.
- (7) Do not put the modular plug of the connected twisted pair cable on objects that can carry static charge, such as carpet. Do not place it in the proximity. Static electricity could lead to equipment failure.
- (8) Do not put a strong shock, including dropping, to this Switching Hub. Deviation could lead to equipment failure.
- (9) Before connecting a console cable to the console port, discharge static electricity, for example by touching metal appliance (do not discharge by touching this Switching Hub).
- (10) Do not store and/or use this Switching Hub in the environment with the characteristics listed below.  
(Store and/or use this Switching Hub in the environment in accordance with the specification.)
  - High humidity. Possible spilled liquid (water).
  - Dusty. Possible static charge (such as carpet).
  - Under direct sunlight.
  - Possible condensation. High/low temperature exceeding the specifications environment.
  - Strong vibration and/or strong shock.
- (11) Please use this Switching Hub in place where ambient temperature is from 0 to 50° C.  
Failure to meet the above conditions may result in fire, electric shock, breakdown, and/or malfunction.  
Please take notice because such cases are out of guarantee.  
Additionally, do not cover the bent hole of this Switching Hub.  
Deviation could lead to high internal temperature, equipment failure and/or malfunction.
- (12) When using two Switching Hubs, do not stack them. When you place them side by side, allow for a space of 20 mm or more between them.
- (13) Operation is not guaranteed if a module other than the optional SFP extension modules (PN54022-SG/PN54024-SG) is inserted into the SFP extension slot.  
For the latest information about compatible SFP extension modules, check our website.
- (14) Select the appropriate cables and lay them.  
Communications might be affected by how the cables are laid, and environmental noise.

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