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1. Summary

Switch-S24GPWR is an Ethernet Switching Hub with management function having 24 ports of 10/100/1000BASE-T. Port 1 to 24 support IEEE802.3af PoE power supply function.

2. Features

- (1) Has wire-speed Layer 2 switching function.
- (2) Ports 1 to 24 are 10/100/1000BASE-T ports corresponding to auto-negotiation. Also their speed and communication mode can be switched by configuration.
- (3) Port 1 to 24 can supply power conforming with IEEE802.3af. Supplying power up to 15.4 W per port, and up to 124W in total is possible.
- (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. (This function does not work if the port communication configuration is set at Fixed or Link Aggregation. Ports 1 to 22 are set at MDI-X. (default))
- (5) Telnet allows remote configuration changes and verifications of the Switching Hub. Remotely configure the PoE setting for each port (Ports 1 to 24).
- (6) Has the IEEE 802.3az (LPI)-compliant Energy Efficient Ethernet function (hereafter referred to as EEE). This function automatically saves power when there is no data communication in the linkup state, allowing a reduction in the power consumption of each port.
- (7) Embedded power saving mode detects the connection status automatically and saves power consumption to minimum.
- (8) VLAN function allows free grouping of up to 256 VLANs.
- (9) The IEEE802.1p compatible QoS function is supported.
- (10) Has a loop detection function, which notifies when a loop occurs with the corresponding port LED and automatically shuts down the looped port.
- (11) Has a loop detection history function, which notifies when a loop occurs with the corresponding LED and enables a network administrator to identify the looped port after the loop is removed.
- (12) The PoE scheduler function enables scheduling of PoE power supply control.
- (13) Supports ZERUO assist Plus. Processes from introduction to maintenance can be performed easily.

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3. Rated/Environmental Conditions

3-1. Power supply	AC100-240V, 50/60Hz, 2.6A (with a built-in power supply)
3-2. Power consumption	Normally, Max.162W (24.1W when not supplying power), Min.12.7W
3-3. Operating environment	Temperature: 0 - 45°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 22 Class A EN 55022 Class A EN 55032 Class A AS/NZS CISPR22 Class A VCCI Class A EN 61000-3-2, EN 61000-3-3 CISPR 24 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 60950-1 EN 60950-1
3-7. Environment compliance	RoHS compliant

4. Form

4-1. Form and materials/colors	Dimensions : 44mm (Height) × 440mm (Width) × 256mm (Depth) (Excluding protruding sections) Case material : SECC Color : Main unit: Green 03, Front face: Black 03, Face plate label: Black 04
4-2. Mass (Weight)	3,600g

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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 IEEE802.3ab 1000BASE-T</p> <p>Energy Efficient Ethernet (*2) :IEEE802.3az(LPI) Transmission speed :10/100/1000Mbps, full/half 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, or 1000Mbps and full duplex or half duplex.</p> <p>Up to 15.4 W of power can be supplied to ports 1 to 24.</p> <p>*1 Embedded power saving mode detects the connection status automatically and saves power consumption to minimum. *2 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.</p>
5-2. Switching mode	<p>Switching method :Store and Forward Switching capacity :48Gbps 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 8K entry/unit Automatic learning can be enabled/disabled for each port. Fixed registration is enabled.</p> <p>Buffer memory :512K Byte/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</p>
5-3. Terminal emulator connection	<p>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</p>

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5. Hardware Specifications

5-4. LED display

- (1) POWER (Power) LED
Green Light : Power is ON
Off : Power is OFF
- (2) ANY COL. (Collision) LED
Orange Light : During half-duplex operation, packet collision is occurring in either port.
- (3) PoE LIM. (PoE limit) LED
Off : Supplying power in the range from 0 to 117 W.
Green Light : Supplying power in the range from 117 to 124 W.
Orange Blink : A single port's power supply is exceeding the upper limit, or the total power supply of the Switching Hub is exceeding 124 W.
- (4) STATUS/ECO (Status/ECO mode) LED
Green Light : Operating in status mode.
Green Blink : Operating in ECO mode.
All port LEDs (left) are turned off.
Orange Light : Starting
Orange Blink : Malfunction (Contact the seller)
- (5) PoE (Power supply mode) LED
Green Light : Operating in power supply mode.
- (6) GIGA (GIGA mode) LED
Green Light : Operating in GIGA mode.
- (7) 100M (Speed mode) LED
Green Light : Operating in Speed mode.
- (8) FULL (DUPLEX mode) LED
Green Light : Operating in DUPLEX mode.
- (9) LOOP HISTORY (Loop History mode) LED
Green Light : Operating in Loop History mode.
Green Blink : Loop is occurring ,
or occurred within the last 3 days.

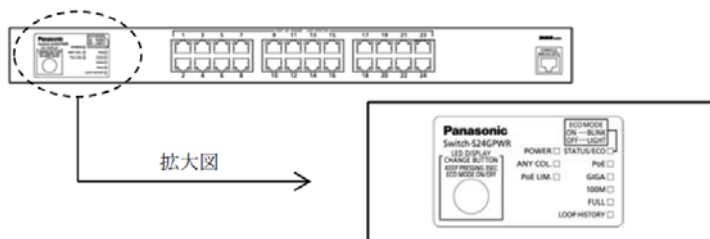
Using "LED DISPLAY CHANGE BUTTON" on the front panel, you can switch the following operations: indication of a connection status with a connected terminal (Status mode), indication of PoE power supply (PoE mode), indication of communication speed at 1000 Mbps (GIGA mode), indication of communication speed at 100 Mbps or 10 Mbps (Speed mode), indication of transmission mode of full-duplex or half-duplex (DUPLEX mode), indication of a port having a history of loop occurrence (Loop History mode), or turning off LEDs of all ports (ECO mode).

Mode at booting is called as Base mode. There are two types of Base modes, which are Status mode (default setting at shipment) and ECO mode.

To switch the Base mode, keep pressing "LED DISPLAY CHANGE BUTTON" for 3 seconds or more.

When switching is done successfully, 5 LEDs of STATUS/ECO LED, PoE LED, GIGA LED, 100M LED, and FULL LED are lighted once at the same time, they turned off, and then it enters a Base mode. After switching to PoE mode, GIGA mode, Speed mode, DUPLEX mode, or Loop History mode, and "LED DISPLAY CHANGE BUTTON" is not used for 1 minute, it automatically returns to Base mode (Status mode or ECO mode).

Base mode is held even if power supply was turned OFF.



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5. Hardware Specifications

5-4. LED display

Switch two types of Base modes and their LEDs in the following way:

When Base mode is Status mode (factory default setting)

When Base mode is ECO mode

LED lamps for each mode and LED lamps for ports 1 to 24 correspond as the following. (Table 1)

Table 1

Port LED	Display mode	Behavior	Description
Left	STATUS/ECO	Green Light	Link is established
		Green Blink	Transmitting and receiving data.
		Off	No device connected.
	PoE	Green Light	Supplying power normally (ports 1 to 24 only)
		Orange Blink	Overload caused by a single port or the total power supply of the Switching Hub (ports 1 to 24 only).
		Off	Not supplying power or no PoE-powered device connected.
	GIGA	Green Light	Link is established at 1000Mbps.
		Off	Link is established at 100Mbps or 10Mbps, or no device is connected.
	100M	Green Light	Link is established at 100Mbps.
		Off	Link is established at 1000Mbps or 10Mbps, or no device is connected.
	FULL	Green Light	Link is established at full-duplex.
		Off	Link is established at half-duplex or no device is connected.
LOOP HISTORY	Green Light	Loop has been detected within the last 3 days.	
	Off	No Loop detection history.	
	Orange Light	Shutting down by loop detection.	
Right	-	Off	Not shutting down by loop detection.

5-5. Cascade connections

Displays the Auto MDI/MDI-X function settings. Ports 1-22 are set to "Disable," and Ports 23-24 are set to "Enable" at factory default setting.

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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. (3) Configuration from a remote terminal via the Internet.
6-2. Switching Hub Control	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 TELNET and TCP/IP network connection. The switching Hub operation status can be checked using the following functions. (1) Function to display the CPU usage and memory usage
6-3. Rebooting	The system can be reset from the software in the following three modes: (1) Warm start (2) Reset to factory default (3) Reset items other than the IP address to factory default The reboot timer function can also be used in each mode.
6-4. Supported Agent	Management protocol : TELNET (RFC854) Data transfer protocol : TFTP (RFC783)
6-5. System log	Maximum number to be kept: 1,024
6-6. Loop detection	Turns on the port LED with a orange light when a loop occurs in the corresponding port. At this time, the relevant port automatically shuts down (default setting: 60 sec.) to prevent loop from occurring. During loop is occurring, or if loop has occurred within the latest 3 days, LOOP HISTORY LED blinks to notify this. · Loop detection setting Enabled (factory default setting) Enabled/disabled can be switched by configuring a setting using the console. The setting is kept even when the power is turned OFF. · Loop detection port Enabled: Ports 1 to 22 (factory default setting) Disabled: Ports 23 and 24 (factory default setting) · Loop shutoff time 60 to 86,400 sec. (Factory default setting: 60 sec.) The set time Port LED lights up orange and the port shuts off. · Loop history retention time 3 days The LOOP HISTORY LED lamp flashes for three days. The Port LED lamp also remains lit for three days after the loop is eliminated.
6-7. Others	TFTP Client (Upgrades the software and saves/loads configuration information.) SNTP Client ZEQUO assist Plus PoE timer applications

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7. Layer 2 Switching Functions

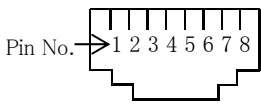
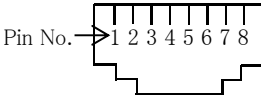
7-1. VLAN	IEEE802.1Q Tag VLAN Protocol Port Base VLAN Number of VLAN registrations: 256 (including default)
7-2. Trunking	IEEE802.ad Link Aggregation function (Manual) Up to 8 groups can be created (up to 8 ports per group).
7-3. Port Monitoring	Traffic of the target port can be copied to the specified port and transmitted. (Two or more target ports can be specified.)
7-4. QoS	IEEE802.1p Four levels of Priority Queue supported Scheduling Method: Strict Priority Queuing (SPQ:Strict priority queuing)
7-5. PoE power supply function	IEEE802.3af PoE power supply function. Up to 124 W of power can be supplied to ports 1 to 24 in total. (Maximum power supplied to a port: 15.4 W) Supply method :Alternative A(Cable signal lines 1, 2, 3, and 6 are used.)
7-6. PoE scheduler function	PoE power supply control can be scheduled. The setting can be configured by the month, week, day or specific date. The maximum number of schedules to be registered: 32

8. WEB Browser-based Control (WEB control screen)

8-1. System Requirements	
8-1-1. WEB Browser	Microsoft Internet Explorer 11
8-1-2. Runtime for Executing Java Applet	Java Runtime Environment (Ver. 1.4 and above)
8-2. Configuration Function	
8-2-1. Switch Configuration	Administration Configuration IP Address Configuration Port Configuration System Security Configuration ID/Password Change Forwarding Database(FDB) Configuration Time (SNTP) Configuration VLAN Configuration Port Monitoring Configuration QoS Configuration Static ARP Table Link Aggregation
	Loop Detection Configuration Ping Execution Exception Handler Watchdog Timer PoE Configuration Statistics Software Update Configuration File Transfer System Reboot Configuration System Log Save Settings Storm Control Configuration
8-2-2. Time Configuration	SNTP setting
8-3. Monitoring Configuration	
8-3-1. General Information	System Information Setting :Display of host name (sysName)

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9. Connector Pin Arrangement

9-1. Port 1 - 24										
Status	Pin No.	1	2	3	6	4	5	7	8	
MDI-X	Signal	BLDB+	BLDB-	BLDA+	BLDA-	BLDD+	BLDD-	BLDC+	BLDC-	
MDI	Signal	BLDA+	BLDA-	BLDB+	BLDB-	BLDC+	BLDC-	BLDD+	BLDD-	
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"> (1) Installation Guide :1 (2) CD-ROM :1 (3) Rubber foot :4 (4) Mounting bracket (for 19-inch rack) :2 (5) Screw (for 19-inch rack) :4 (6) Screw (for fixing the main unit and the 19 inch rack mount bracket) :8 (7) Power cord (BS1363)(*) :1
(*) The attached power cord is dedicated for AC 100 - 240 V use.	

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11. Prohibitions when Using the Product to Guarantee Safety

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 the power cord with wet hand.
Deviation could lead to electric shock, and/or equipment failure.
- (3) Do not handle this Switching Hub and connection cables during a thunderstorm.
Deviation could lead to electric shock.
- (4) Do not disassemble and/or modify this Switching Hub.
Deviation could lead to fire, electric shock, and/or equipment failure.
- (5) 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.
- (6) Do not put foreign objects (such as metal and combustible) into the opening (such as twisted pair port, console port), and/or do not drop them into the inside of the Switching Hub.
Deviation could lead to fire, electric shock, and/or equipment failure.
- (7) Do not connect equipments other than 10BASE-T/100BASE-TX/1000BASE-T to twisted pair port.
Deviation could lead to fire, electric shock, and/or equipment failure.
- (8) Do not place this Switching Hub in harsh environment (such as near water, high humid, and/or high dust).
Deviation could lead to fire, electric shock, and/or equipment failure.
- (9) Do not place this Switching Hub under direct sunlight and/or high temperature.
Deviation could lead to high internal temperature and fire.
- (10) Do not install this Switching Hub at the location with continuous vibration or strong shock, or at the unstable location.
Deviation could lead to injury and/or equipment failure.
- (11) Do not put this Switching Hub into fire.
Deviation could lead to explosion and/or fire.
- (12) Do not use the supplied power cord for anything other than this product.
Deviation could lead to fire, electric shock, and/or equipment failure.
- (13) Unplug the power cord in case of equipment failure.
Deviation, such as keeping connected for a long time, could lead to fire.
- (14) Connect this Switching Hub to ground.
Deviation could lead to electric shock, malfunction, and/or equipment failure.
- (15) Connect the power cord firmly to the power port.
Deviation could lead to electric fire, shock, and/or malfunction.
- (16) Unplug the power cord if the STATUS/ECO LED (Status/ECO mode) blinks in orange (system fault).
Deviation, such as keeping connected for a long time, could lead to fire.

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12. Prohibitions when Using the Product to Guarantee Safety

- (17) Handle the Switching Hub carefully so that fingers or hands may not be damaged by twisted pair port, console port, or power cord hook block.
- (18) To connect a power receiving equipment supporting IEEE802.3at to this Switching Hub, use a cable rated Cat5e or higher.

13. Basic Instructions for the Use of This Product

- (1) For inspection and/or repair, consult the retailer.
- (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. 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 45°C. Failure to satisfy the conditions above may result in a fire, electric shock, equipment failure, and/or malfunction. Such events are not covered by the warranty. Do not block the ventilator of the Switching Hub. Blocked ventilator induces the heat accumulation inside, causing equipment failure and/or malfunction. If used at a temperature out of the operating temperature range, the protection equipment becomes activated and PoE power supply stops.
- (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.

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