1. Summary

Switch-M5eGLPWR+ is an Ethernet Switching Hub with management function having 4 ports of 10/100/1000BASE-T and two pairs of 10/100/1000BASE-T ports and SFP extension slot, one of which is selectable.
Ports 1 to 4 support IEEE802.3at PoE power supply function.

2. Feature

(1) Has wire-speed Layer 2 switching function.

(2) Ports 1 to 4 are 10/100/1000BASE-T ports corresponding to auto negotiation.
Also their speed and communication mode can be switched by configuration.
Ports 5 and 6 can be used as a 10/100/1000BASE-T port corresponding to auto negotiation or an SFP extension slot exclusively.

(3) Ports 1 to 4 can supply power conforming with IEEE802.3at. Supplying power up to 30 W per port, and up to 62 W 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 4 are set at MDI-X. (default))

(5) Telnet allows remote configuration changes and verifications of the Switching Hub.
Remotely configure the PoE settings for each port (Ports 1 to 4).

(6) 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.

(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 IEEE802.1w Rapid Spanning Tree Protocol is supported, allowing to build a system with redundancy.

(10) The IEEE802.1p compatible QoS function is supported.

(11) The IEEE802.1X compatible user authentication function (EAP-MD5/TLS/PEAP) is supported.

(12) Has an Internet Mansion function, which ensures security between each door.

(13) 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.

(14) The PoE scheduler function enables scheduling of PoE power supply control.

3. Rated/Environmental Conditions

3－1. Power supply	AC100-240V, 50/60Hz, 3.0A (with a built-in power supply)
3－2. Power consumption	Normally, Max.83.8W (12.7W when not supplying power), Min.9.3W
3－3. Operating environment	Temperature: 0 - 50℃ Humidity: 20 - 80%RH (no condensation)
3－4. Storage environment	Temperature: -20 - 70℃ 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)×210mm(Width)×260mm(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)	1,900g

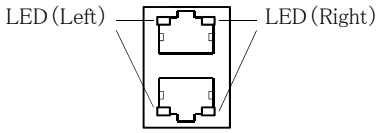
5. Hardware Specifications

5－1. Interface	Twisted pair port 1-6 :RJ45 connector (*1) Transmitting and receiving network system: IEEE802.3 10BASE-T IEEE802.3u 100BASE-TX IEEE802.3ab 1000BASE-T 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) 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. Up to 30 W of power can be supplied to ports 1 to 4. *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. SFP extension slot 5,6 SFF-8472(DMI:Diagnostic Monitoring Interface) *Select either of RJ45 or SFP for use Optional Accessories :1000BASE-SX SFP Module (PN54021K-SG) 1000BASE-LX SFP Module (PN54023K-SG)

5. Hardware Specifications

5－2. Switching mode	Switching method :Store and Forward Switching capacity :12Gbps Packet transfer capability :Non-blocking Max 1,488,000pps/port(1000Mbps) Max 148,800pps/port(100Mbps) Max 14,880pps/port(10Mbps) MAC Address table :Max 8K entry/unit Automatic learning can be enabled/disabled for each port. Fixed registration is enabled. Buffer memory :512K Byte/unit Flow control :half-duplex Back pressure full-duplex IEEE802.3x Aging timeout :10 to 1,000,000 sec. (Default: 300 sec.) Jumbo frame supported :9KB Transmittable frames :EAP,BPDU
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. LED display	(1)POWER(Power)LED Green Light :Power is ON Off :Power is OFF (2)STATUS/ECO LED(Status/ECO mode) 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) (3)PoE LIM. LED(PoE limit) Off Supplying power in the range from 0 to 47 W. Green Light : Supplying power in the range from 47 to 62 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 62 W. (4)FAN LED (Fan sensor) Green Light : System is operating normally. Orange Blink : Fan fault is occurring. (5)TEMP LED (Temperature sensor) Green Light : The system is normally operating. Orange Blink : The temperature exceeded the set threshold of the internal temperature sensor. Set threshold of the internal temperature sensor: 63° C (factory default) (6)LOOP HISTORY LED (Loop History mode) Green Light : Operating in Loop History mode. Green Blink : Loop is occurring, or occurred within the last 3 days.

5. Hardware Specifications

5－4. LED display	(7) Port LED (left) Green light (when the LOOP HISTORY LED lamp is off) : Link is established at 10/100/1000 Mbps. Green light (when the LOOP HISTORY lamp is flashing) : Within three days after a loop has been eliminated Green flashing : Data is being sent/received at 10/100/1000 Mbps. Orange light : Shut off by the loop detection/shutoff function Off : No terminal is connected or the ECO mode is set. (8) Port LED (right) Green light : Power is supplied normally. (Ports 1 to 4 only) Orange flashing : Overload power supply (ports 1 to 4 only) or overload in a single port. Off : Power is not supplied or PoE receiving equipment is not connected. 
5－5. Cascade connections	Displays the Auto MDI/MDI-X function settings. Ports 1-4 are set to "Disable," and Ports 5-6 are set to "Enable" at factory default setting.

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) 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 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) Fan sensor function (2) Internal temperature sensor function (3) Function to display the CPU usage and memory usage (4) SFP module status checking function (DDM: Digital Diagnostic Monitoring)
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 :SNMP v1/v2c (RFC1157,RFC1901) TELNET (RFC854) SSH v2 (RFC4251,RFC4252, RFC4253,RFC4254,RFC4716) Data transfer protocol :TFTP (RFC783)

6. Software Specifications

6－5. Supported MIB	RFC1213-MIB(MIB Ⅱ) (RFC 1213) SNMPv2-MIB (RFC 1907) IP-FORWARDING-MIB (RFC 2096) only IpCidrRouteTable RMON-MIB (RFC 2819) Group 1,2,3,9 BRIDGE-MIB (RFC 1493) P-BRIDGE-MIB (RFC 2674) Q-BRIDGE-MIB (RFC 2674) IF-MIB (RFC 2233) other than IfTestTable RADIUS-AUTH-CLIENT-MIB (RFC 2618) POWER-ETHERNET-MIB (RFC 3621) deelxSoppConfigTable, other thandotlxSuppStatusTable IEEE8021-PAE-MIB (IEEE802.1X MIB) IEEE8023-LAG-MIB (IEEE802.3ad MIB) RSTP-MIB
6－6. System log	Maximum number to be kept: 1024 Transfers system logs to the Syslog server (IPv4)
6－7. 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 4 (factory default setting) Disabled: Ports 5 and 6 (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.
6－8. Others	Syslog Client (Transfers system logs to the Syslog server.) TFTP Client (Upgrades the software and saves/loads configuration information.) SNTP Client Login RADIUS (login authentication function by the RADIUS server) ZEQUO assist Plus PoE timer applications

7. Layer 2 Switching Functions

7－1. Spanning Tree	IEEE 802.1w Spanning Tree Protocol, Rapid Spanning Tree Protocol
7－2. VLAN	IEEE802.1Q Tag VLAN Protocol Port Base VLAN Number of VLAN registrations: 256 (including default) Internet Mansion function
7－3. Trunking	IEEE802.ad Link Aggregation function (LACP/Manual) Up to 3 groups can be created (up to 6 ports per group).
7－4. Port Monitoring	Traffic of the target port can be copied to the specified port and transmitted. (Two or more target ports can be specified.)
7－5. Multicast	IGMP Snooping(IGMP v1/v2) function Multicast filtering function
7－6. QoS	IEEE802.1p 4 levels of Priority Queue supported Scheduling Method: Priority Queuing (PQ:Strict priority queuing) Weighted Round Robin (WRR:Weighted round robin scheduling) DSCP Mapping function
7－7. Authentication Function	IEEE802.1X Port-based authentication EAP Packet Forwarding function (Enable/disable EAP transmission can be specified for each port.)
7－8. PoE power supply function	IEEE802.3at PoE power supply function. Up to 62 W of power can be supplied to ports 1 to 4 in total. (Maximum power supplied to a port: 30 W) Supply method :Alternative A(Cable signal lines 1, 2, 3, and 6 are used.)
7－9. 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
7－10. Ring protocol	Redundancy is enabled by ring configuration. (Up to one group can be registered.)

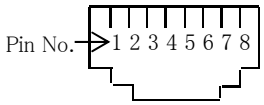
8. WEB Browser-based Control (WEB control screen)

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 SNMP Configuration Port Configuration System Security Configuration ID/Password Change Forwarding Database(FDB) Configuration Time(SNTP) Configuration VLAN Configuration Link Aggregation Configuration Port Monitoring Configuration QoS Configuration Storm Control Configuration Static ARP Table LLDP Configuration 802.1X Access Control Configuration Spanning Tree Configuration Loop Detection Configuration DDM Configuration RRP Domain Management Ping Execution Exception Handler Watchdog Timer IGMP Snooping Configuration PoE Configuration Statistics Software Update Configuration File Transfer System Reboot Configuration System Log Syslog Transmission Configuration Save Settings
8－2－2. Time Configuration	SNTP setting
8－3. Monitoring Configuration	
8－3－1. General Information	System Information Setting : Display of detailed description (sysDescr) Display of contact (sysContact) Display of installation location (sysLocation) Display of host name (sysName)

9. Connector Pin Arrangement

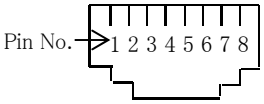
9－1. Port 1 - 6

Status	Pin No.	1	2	3	6	4	5	7	8
MDI-X	Signal	BI_DB+	BI_DB-	BI_DA+	BI_DA-	BI_DD+	BI_DD-	BI_DC+	BI_DC-
MDI	Signal	BI_DA+	BI_DA-	BI_DB+	BI_DB-	BI_DC+	BI_DC-	BI_DD+	BI_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	(1) Mounting to rack
10－2. Accessories	(1) Installation Guide :1 (2) CD-ROM :1 (3) Rubber foot :4 (4) Mounting bracket (for 19-inch rack) :2 (5) Connecting bracket :2 (6) Screw (for 19-inch rack) :4 (7) Screw (for fixing the main unit and the 19 inch rack mount bracket) :8 (8) Screw (for Connecting bracket) :8 (9) Power cord (BS1363)(*) :1 (*) The attached power cord is dedicated for AC 100 - 240 V use.

11. Optional Accessories

11－1. 1000BASE-SX SFP Module (Model No. :PN54021K-SG)	Fiber optic port connector type :LC connector (Duplex) Standards :IEEE802.3z 1000BASE-SX Transmission speed : 1000Mbps, full duplex Compatible cable :Fiber cable 50/125 μm Multi Mode Fiber 62.5/125 μm Multi Mode Fiber Maximum transmission distance :550 m at 50/125 μm 220 m at 62.5/125 μm
11－2. 1000BASE-LX SFP Module (Model No.:PN54023K-SG)	Fiber optic port connector type :LC connector (Duplex) Standards :IEEE802.3z 1000BASE-LX Transmission speed : 1000Mbps, full duplex Compatible cable:Fiber cable 10/125 μm Single Mode Fiber 50/125 μm Multi Mode Fiber 62.5/125 μm Multi Mode Fiber Maximum transmission distance :10 km when Single Mode Fiber is used 550 m when Multi Mode Fiber is used

12. 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 unplug nor plug in the power plug with wet hands.
Deviation could lead to electrical shock, and/or equipment failure.

(7) 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, electrical shock, and/or equipment failure.

(8) 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.

(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 insert nor drop any foreign objects such as metal or readily combustible things into the inside through the openings, twisted pair ports, console ports, SFP extension slots.
Deviation could lead to fire, electrical shock, and/or equipment failure.

14. Basic Instructions for the Use of This Product

(1) Handle the Switching Hub carefully so that fingers or hands may not be damaged by twisted pair port, SFP extension slot, console port, or power cord hook block.

(2) 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.

(3) Do not insert any other modules except for the our optional SFP module (PN54021K/PN54023K) to the SFP extension slots.

(4) Unplug the power plug when there is a malfunction.
Deviation could lead to fire if the power is allowed to be supplied for extended periods of time.

(5) 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.

(6) Use the bundled power cord (AC 100 - 240 V specifications).
Deviation could lead to electric shock, malfunction, and/or equipment failure.

(7) Unplug the power cord in case of equipment failure.
Deviation, such as keeping connected for a long time, could lead to fire.

(8) Connect this Switching Hub to ground.
Deviation could lead to electric shock, malfunction, and/or equipment failure.

(9) Connect the power cord firmly to the power port.
Deviation could lead to electric fire, shock, and/or malfunction.

(10) Unplug the power cord if the STATUS LED blinks in orange (system fault).
Deviation, such as keeping connected for a long time, could lead to fire.

(11) 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.

(12) 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.

(13) 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.

(14) It is strongly recommended that a lightning arrester (SPD) be installed on the twisted pair port side and the power supply side of this Switching Hub.
Malfunctions might be caused due to overcurrent and overvoltage due to the effects of lightning strikes.

(15) 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.

(16) 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.