



Wavesys
Industrial Grade Switch

DATASHEET



WSL-1600-M12XB-24-67

16-Port Industrial M12 Gigabit PoE+ Managed Ethernet Switch
-16*10/100/1000Base-T(X) with PoE-PSE(30W/Port)



About the Switch: Wavesys's WSL-1600-M12XB-24-67 Series is a 16-port managed Gigabit Ethernet switch, which provides 16*10/100/1000 Base-T(X) with IEEE 802.3 af/at PoE compliant. WSL-1600-M12XB-24-67 Series is a fully manageable Layer-2 Ethernet switch series and supports power input redundancy. WSL-1600-M12XB-24-67 Series offers standardized network redundancy ITU-T G.8032 ERPS v2 (Ethernet Ring Protection Switch) protocol, providing <50ms recovery time to the network, to give users the chance to choose your Ethernet switch but not tied up with a particular brand's product.

WSL-1600-M12XB-24-67 Series provides comprehensive network security and management capability by supporting Multiusers account, IGMP, GVRP, VLAN, QoS, SNMP, RADIUS, TACACS+, Aggregation(Static, LACP), SSH, SSL, IP source guard to create a highly-secured network environment. For power saving purposes, assuring PD priority, and enhancing security level of the network, WSL-1600-M12XB-24-67 also supports PoE scheduling and PoE output limit function to set up PoE output duration and watt at will..

WSL-1600-M12XB-24-67 as an industrial Ethernet switch product line is designed to withstand harsh and extreme environmental conditions. With a fan-less design, WSL-1600-M12XB-24-67 Series still manage to be applied in extremely polarized temperature, from -40oC to 70oC, making it the best choice in various industrial applications.

Key Features

- 16-port 10/100/1000Base-T(X) Ethernet with 802.3af/at compliant PoE, 30W/port
- Multiusers account for security
- Bypass design for Daisy Chain Redundancy
- Configuration: http, https, CLI Command, Telnet, SNMP, SSH
- Network redundancy support: G.8032 ERPS v2/ STP/ RSTP/ MSTP
- Supports Static routes for routing function
- Supports RADIUS, TACACS+ authentication protocol
- Supports QoS, LACP bandwidth control
- Supports VLAN, SNMP v1/v2c/v3, ACL, IP source guard for Ethernet security
- PoE ping alarm function for PoE ports power recycle
- Redundant power inputs design
- Operating temperature range - STD: - 10°C ~ 65°C, Extd: -40°C ~ 70°C

Specification

Technology

Standards	IEEE 802.3 10Base-T Ethernet IEEE 802.3u 100Base-TX Fast Ethernet IEEE 802.3ab 1000Base-T IEEE 802.3z 1000Base-X Gigabit Fiber IEEE 802.3af/at Power over Ethernet IEEE 802.3x Flow Control IEEE 802.1d STP (Spanning Tree Protocol) IEEE 802.1w RSTP (Rapid Spanning Tree Protocol) IEEE 802.1s MSTP (Multiple Spanning Tree Protocol) ITU-T G.8032 / Y.1344 ERPS v1/v2(Ethernet Ring Protection Switch) IEEE 802.1Q Virtual Local Area Network (VLAN) IEEE 802.1p QoS/CoS Protocol for Traffic Prioritization IEEE 802.1X Network Authentication IEEE 802.1AB Link Layer Discovery Protocol (LLDP) IEEE 802.3ad Link Aggregation (LACP)
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Processing Type	Store and Forward
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Flow Control	IEEE 802.3x flow control, back pressure flow control
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Network Management

Management	IPv4/IPv6, SNMP v1/v2c/v3, LLDP, LLDP-MED, HTTP, HTTPS, SSHv2 telnet, DHCP client, DHCPv6 client, DHCP server, Port Mirror, DNS client/proxy, IP based Access Filter, ICMPv6, syslog, Time Zone /Daylight Saving, NTP client, RMON, sFlow, Loop detection, Console Port, Power lost warning, relay trigger
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Security	Port-based/Single/Multi 802.1X, ACL(Port/Rate Limiters/ACE), MAC-based Authentication, VLAN
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Security	TACACS+, IP MAC binding, WEB/CLI authentication, Authorization (15 levels), Port Security Limit Control, ACLs for filtering/policing/port copy, IP source guard, ARP Inspection
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L2 Switching	Port/MAC/Protocol/IP Subnet-based VLAN, VLAN trunking, GARP/GVRP, Loop Guard, Link Aggregation static/LACP, BPDU guard, Error disable recovery, IGMPv2 snooping, MLD snooping, IGMP filtering, IPMC throttling / filtering leave proxy, DHCP snooping, ARP, MEP, G.8032 v1/v2
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L3 Switching	DHCP option82, static routes
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QoS	802.1p Queueing, Input priority mapping, Storm control for Unicast/Multicast/Broadcast, Port/Queue/ACL policer, Port egress shaper, Queue egress shaper, DiffServ (DSCP), Tag remarking, Scheduler mode
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Power Saving	ActiPHY, PerfectReach, IEEE 802.3az EEE power management
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Network Redundancy	STP/RSTP/MSTP, port trunk with LACP, ERPS v1/v2 (<50ms)
Configuration	Http, Https, Telnet, SSH, CLI, TFTP, SNMP v3
PoE	POE/POE+ port power allocation, Power budget protection, PoE output scheduled, PoE alive check and remote reboot PD device
System / Diagnostics	Dual Image Protection, PING, PING6

SNMP MIBs & RFC Standards

RFC 2674 VLAN MIB
 IEEE-802.1Q bridge MIB 2008
 RFC 2819 RMON (group 1, 2, 3, and 9)
 RFC 1213 MIB II
 RFC 1215 TRAPS
 RFC 4188 bridge
 RFC 4292 IP forwarding table
 RFC 4293 management information base for the Internet Protocol (IP)
 RFC 5519 multicast group membership discovery
 RFC 4668 RADIUS auth. client
 RFC 4670 RADIUS accounting
 RFC 3635 Ethernet-like
 RFC 2863 interface group MIB using SMI v2
 RFC 3636 802.3 MAU
 RFC 4133 entity MIB v3
 RFC 3411 SNMP management frameworks
 RFC 3414 user-based security model for SNMPv3
 RFC 3415 view-based access control model for SNMP
 RFC 2613 SMON – PortCopy
 IEEE 802.1 MSTP
 IEEE 802.1AB LLDP-MIB (LLDP MIB included in a clause of the STD)
 IEEE 802.3ad (LACP MIB included in a clause of the STD)
 IEEE 802.1X (PAE MIB included in a clause of the STD)
 TIA 1057 LLDP-MED (MIB is part of the STD)
 RFC 3621 LLDP-MED Power (POE) (No specific MIB for POE+ exists)

Switch Properties

(Back-Plane) 32Gbps

Priority Queues 8

Max. Number of VLANs 4095

VLAN ID Range VID 1 to 4095

Memory Buffer 32Mbits

Jumbo Frame 9.6Kbytes

MAC Table Size 32K

IGMP Group 1024

Transfer Rate	14,880pps for Ethernet port 148,800pps for Fast Ethernet port 1,488,000pps for Gigabit Ethernet port
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Interface

Rj45 Ports	16*10/100/1000 Base-T(X), 8-pin M12 X-Coded female connectors. Auto-Negotiation, Full/Half Duplex, Auto-MDI/MDI-X
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PoE Pin Out	V+, V+, V-, V-, for pin 1, 2, 3, 6 (End-span, Mode A)
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Wavelength	Depends on SFP modules
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LED Indicators	System: Power 1, Power 2, Master, Ring, Fault Ethernet ports: Speed/Link/Active PoE: On-connected to PD devices SFP: Link/Active
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Rs232 Serial Console	1*RS232 in RJ45 connector with console cable, baud rate 115,200bps,8,N,1
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Relay Contact	24 VDC, 1A resistive
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Configuration Backup Relay Contact	1*USB 2.0 with M12 4-pin A-coded female connector for configuration backup/restore 24 VDC, 1A resistive
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Network Cable	10Base-T: 2-pair UTP/STP Cat. 3, 4, 5 cable EIA/TIA-568 100-ohm (100m) 100Base-TX: 2-pair UTP/STP Cat. 5 cable EIA/TIA-568 100-ohm (100m) 1000Base-TX: 4-pair UTP/STP Cat.5/5E cable; EIA/TIA-568 100-ohm (100m)
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Optical Cable	Multi-mode cable - 50/125um or 62.5/125um, Single-mode cable - 9/125um or 10/125um
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DI	1* Digital Input (DI): State 0: -30~8VDC / State 1: 10~30VDC, Max. input current: 8mA
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Power Requirements

Input Voltage	WSL-1600-M12XB-24-67 Series: Dual 48-55VDC redundant power input WSL-1600-M12XB-24-67 Extd Series: Dual 12-55VDC redundant power inputs
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Power Connection	Dual DC power inputs through M12 4-pin K-coded male Connector
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Overload Current Protection	Present (Slow-Blow Fuse)
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Reverse Polarity Protection	Present
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System Power Consumption	WSL-1600-M12XB-24-67 Series: Max. 28W full loading WSL-1600-M12XB-24-67 Extd Series: Max. 45W full loading
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Max. PoE Power Budget	WSL-1600-M12XB-24-67 Series: 240W WSL-1600-M12XB-24-67 Extd Series: 120W
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PoE Power Output	30W max. per PoE port
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Mechanical Characteristics

Housing	Metal, IP30 protection
Dimensions (W x H x D)	160 x 295 x 101.3 mm (6.3x 11.6 x 4.0 inch)
Weight	WSL-1600-M12XB-24-67 Series: Unit weight: 4.108 kg (9.06 lb), Shipping weight: 4.834 kg (10.66 lb) WSL-1600-M12XB-24-67 Extd Series: Unit weight: 4.268 kg (9.41 lb), Shipping weight: 4.992 kg(11.01 lb)

Environmental Limits

Operating Temperature	STD: -10°C ~ 65°C (14°F ~ 149°F) Extd: -40°C ~ 75°C (-40°F ~ 167°F)
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Storage Temperature	-40°C ~ 85°C (-40°F ~ 185°F)
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Ambient Relative Humidity	5 to 95%, (non-condensing)
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Regulatory Approvals

EMI	FCC Part 15 Subpart B Class A, CE EN55032/EN61000-6-4 Class A
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EMS	CE EN55035/EN61000-6-2 Class A: IEC61000-4-2 (ESD), IEC61000-4-3 (RS), IEC61000-4-4 (EFT), IEC61000-4-5 (Surge), IEC61000-4-6 (CS), IEC61000-4-8 (Magnetic Field)
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Free Fall	IEC60068-2-32
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Shock	IEC60068-2-27
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Vibration	IEC60068-2-6
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Green	RoHS Compliant
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Safety	UL61010-1, UL61010-2-201
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Compliance	NEMA TS2 (ITS) (apply by request)
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MTBF (Telcordia SR-332, Issue	WSL-1600-M12XB-24-67 Series: 271,943 hrs.
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3, GB, 25°C) Warranty	WSL-1600-M12XB-67 Series: 271,943 hrs. 5 Years
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NOTE: Due to continuous improvement, all product specifications are subject to change without further notice.

Optional Accessories - Power Supply Series

30W Power Supply Series

WHDR-30-24 36W Industrial DIN-Rail Power Supply, 24VDC/1.5A, Universal 85-264VAC/120-370VDC power input, Plastic, -30°C ~ 70°C

60W Power Supply Series

WHDR-60-24 60W Industrial DIN-Rail Power Supply, 24VDC/2.5A, Universal 88-264VAC/124-370VDC power input, Plastic, -30°C ~ 70°C

WMDR-60-24 60W Industrial DIN-Rail Power Supply, 24VDC/2.5A, Universal 85-264VAC/120-370VDC power input, Plastic, -20°C ~ 70°C

75W Power Supply Series

WEDR-75-48 75W Industrial DIN-Rail Power Supply, 48VDC/1.6A, Universal 90-264VAC/127-370VDC power input, Metal, -20°C ~ 60°C

WNDR-75-48 75W Industrial DIN-Rail Power Supply, 48VDC/1.6A, Universal 90-264VAC/127-370VDC power input, Metal, -20°C ~ 70°C

120W Power Supply Series

WEDR-120-48 120W Industrial DIN-Rail Power Supply, 48VDC/2.5A, Universal 90-264VAC/127-370VDC power input, Metal, -20°C ~ 60°C

WNDR-120-24 120W Industrial DIN-Rail Power Supply, 24VDC/5A, Universal 90-264VAC/127-370VDC power input, Metal, -20°C ~ 70°C

WNDR-120-48 120W Industrial DIN-Rail Power Supply, 48VDC/2.5A, Universal 90-264VAC/127-370VDC power input, Metal, -20°C ~ 70°C

240W Power Supply Series

WNDR-240-48 240W Industrial DIN-Rail Power Supply w/ PFC, 48VDC/5A, Universal 90-264VAC/127-370VDC power input, Metal, -20°C ~ 70°C

WSDR-240-24 240W Industrial DIN-Rail Power Supply w/ PFC, 24VDC/10A, Universal 88-264VAC/124-370VDC power input, Metal, -25°C ~ 70°C

480W Power Supply Series

WNDR-480-48 480W Industrial DIN-Rail Power Supply w/ PFC, 48VDC/10A, Universal 90-264VAC/127-370VDC power input, Metal, -20°C ~ 70°C

Easily Connect & Power Up for Your High-Power PoE Networks

PoE (Power over Ethernet) technology is widely adopted for supporting networking devices power and connectivity when facing the challenge of wiring in rigorous environments with power sourcing limitations. IEEE standards specify the maximum power output from PSE (power sourcing equipment) as well as the power budget for the PD (powered device) to ensure the interoperability of both devices in the market. With the increasing need of higher power in applications, the maximum PD power available is increased by this amendment to IEEE standards.

IEEE 802.3af

Power Sourced
15.4W

Power Requested
13W



IP Camera



IP Phone

IEEE 802.3at

Power Sourced
30W

Power Requested
25.5W



Wireless AP



IP Camera

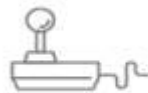
IEEE 802.3bt

Power Sourced
90W

Power Requested
71.3W



PTZ Camera



PTZ Controller



Smart Lighting



Digital Signage

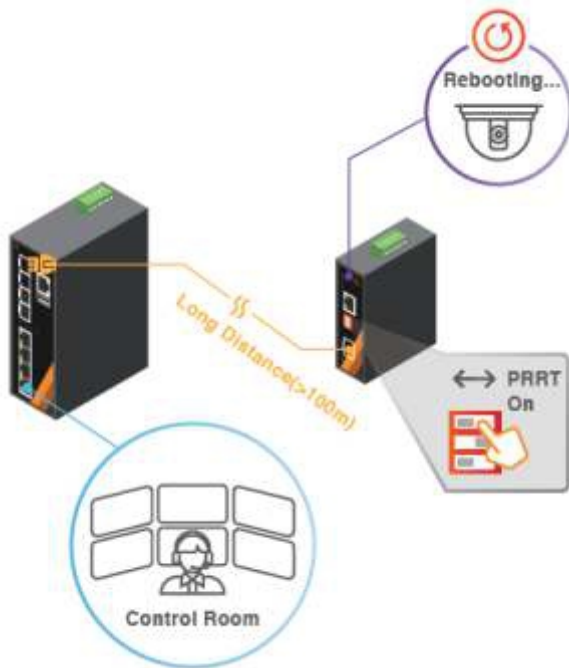


POS System

Time-Saving. Effort-Saving.

PRRT (PD Remote Reset Technology)

Enabling PRRT function can save you hours, miles and lots of efforts. With simply pull and plug on fiber cable of networking device connected with BT PoE product in the near field site, remote PSE system can be rebooted to reset remote PD devices



Persistent PoE

PD devices are connected to collect important data for a wide array of crucial applications, such as video surveillance, to guarantee personal and property safety. It is one of the most users' concerns when it comes to PD devices shut -down in a key moment.

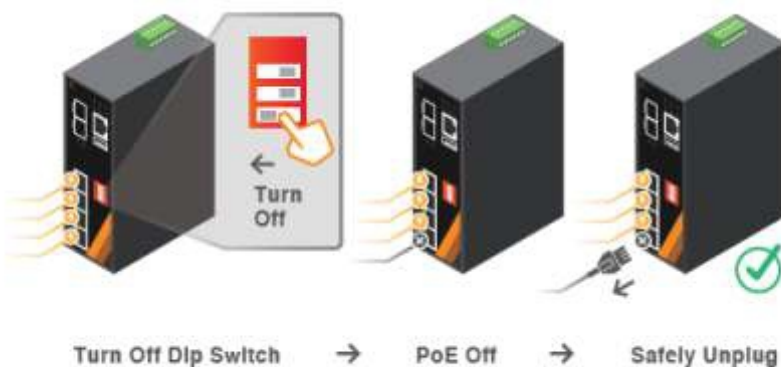
Wavesys' s Persistent PoE provides uninterrupted power delivery to PD devices even when the firmware is being upgraded, ensuring PD devices smooth operation with no worry.



Prevent Electric Spark Risk

Safe PoE Disable

High power PoE (802.3bt) accompanies the risk of electric spark. Safe PoE Disable design allows users to safely unplug the copper cable, ensuring zero electric spark danger and prevent fire hazard.



Responsive PoE Management

Users are able to manage the PoE devices according to different operating status with both hardware and software reminders thoroughly.

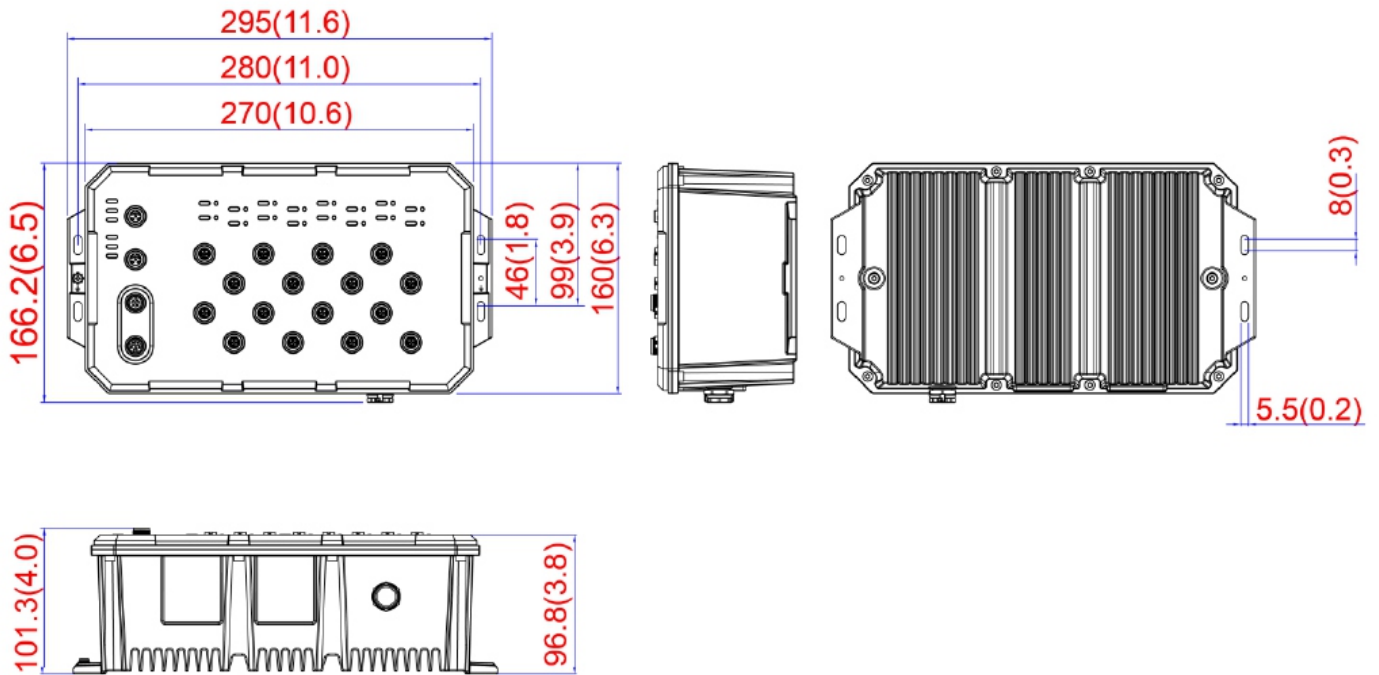
- PoE Budget
- Ping Alive
- PoE Schedule
- Event Indicator
- PoE Loading



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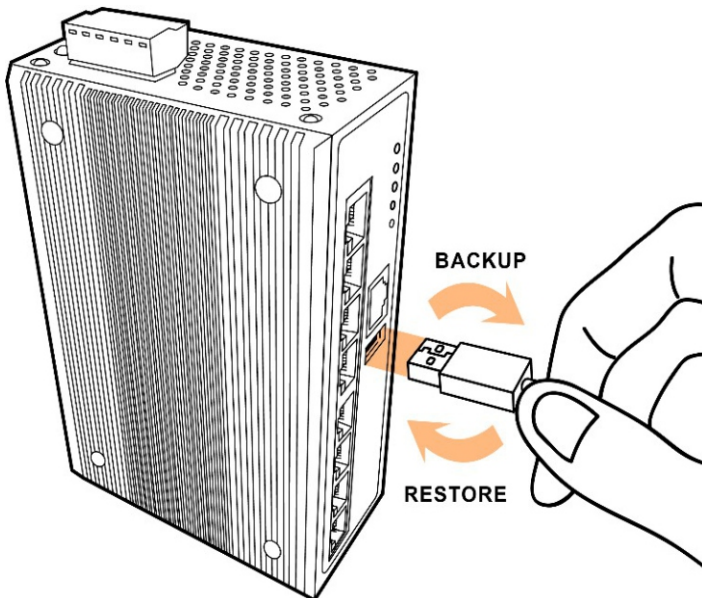


Dimension



Unit: mm (inch)

USB Backup/Restore Function



Wavesys's Managed Ethernet switch series supports USB 2.0 flash drive, which allows user to backup and restore the device configuration to meet the need of quick device swap. And USB port on Managed Ethernet switch series is applicable to the mostcommon USB flash drives, hugely elevating convenience for user.

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