



Industrial Grade Switch

WSI-1600 / WSI-1600 - Extd

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



About the Switch: Wavesys's WSI-1600 Series is a 16-port managed Gigabit PoE Ethernet switch, which provides 16*10/100/1000 Base-T(X) with 16*IEEE 802.3 af/at PoE compliant. WSI-1600 Series is full manageable Layer-2 Ethernet switch series, and supports power inputs redundancy and PoE function with 30W per port output. WSI-1600 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 user the chance to choose your Ethernet switch but not tied up with particular brand's product.

WSI-1600 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 purpose, assuring PD priority and enhancing security level of the network, WSI-1600 Series also supports PoE scheduling and PoE output limit function to set up PoE output duration and watt at will.

WSI-1600 Series as an industrial Ethernet switch product line is designed to withstand harsh and extreme environment conditions. With fan less design, WSI-1600 Series still manage to be applied in extremely polarized temperature, from -40oC to 75oC, making it the best choice in various industrial applications.

Key Features

- 16-port 10/100/1000Base-T(X) Ethernet with IEEE 802.3af/at compliant PoE, 30W/port
- Persistent PoE, Safe PoE Disable, PoE ping alive
- Multiusers account for security
- 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 ~ 75°C

Specification

Technology

Standards	IEEE 802.3 10Base-T Ethernet IEEE 802.3u 100Base-TX Fast Ethernet IEEE 802.3ab 1000Base-T Ethernet IEEE 802.3z 1000Base-X Gigabit Ethernet 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 assignment, QoS Assignment, Private VLAN, Guest VLAN, RADIUS accounting, 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	HCP 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

Switching Fabric (Back-Plane)	32Gbps
Priority Queues	8
Max. Number of VLANs	4095
VLAN ID Range	VID 1 to 4095
Memory Buffer	4Mbits
Jumbo Frame	9.6Kbytes
MAC Table Size	8K
IGMP Group	1024
Transfer Rate	14,880pps for Ethernet port 148,800pps for Fast Ethernet port 1,488,000pps for Gigabit Ethernet port

Interface

Rj45 Ports	16*10/100/1000 Base-T(X) with 16*PoE-PSE (30W/Port) Auto-Negotiation, Full/Half Duplex, Auto-MDI/MDI-X
PoE Pin Out	V+, V+, V-, V-, for pin 1, 2, 3, 6 (End-span, Mode A)
LED Indicators	System: Power 1, Power 2, Master, Ring, Status Ethernet ports: Speed/Link/Active PoE: On-connected to PD devices SFP: Link/Active
Rs232 Serial Console	1*RS232 in RJ45 connector with console cable, baud rate 115,200bps,8,N,1
Configuration Backup	1*USB 2.0 host (type-A) for configuration backup/restore
Relay Contact	24 VDC, 1A resistive
DI	1* Digital Input (DI): State 0: -30~8VDC / State 1: 10~30VDC, Max. input current: 8mA
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)
Optical Cable	Multi-mode cable - 50/125um or 62.5/125um, Single-mode cable - 9/125um or 10/125um

Power Requirements

Input Voltage	Dual 48-55VDC redundant power inputs
Power Connection	2*removable 4-contact terminal block
Overload Current Protection	Present (Slow-Blow Fuse)
Reverse Polarity Protection	Present
System Power Consumption	Max. 13.8W full loading
Max. PoE Power Budget	240W@48-55VDC

Mechanical Characteristics

Housing	Metal, IP30 protection
Dimensions (W x H x D)	67 x 142 x 99 mm (2.64 x 5.59 x 3.90 inch)
Weight	Unit weight: 1.2kg (2.76 lb), Shipping weight: 1.4kg (3.31 lb)
Mounting	DIN-Rail Mounting, Wall Mounting

Environmental Limits

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

Regulatory Approvals

EMI	FCC Part 15 Subpart B Class A, CE EN55032/EN61000-6-4 Class A
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)
Free Fall	IEC60068-2-32
Shock	IEC60068-2-27
Vibration	IEC60068-2-6
Green	RoHS Compliant
Safety	UL61010-1, UL61010-2-201
Compliance	NEMA TS2 (ITS)
Substation	IEC 61850-3 Edition 2.0
MTBF (Telcordia SR-332, Issue 3, GB, 25°C)	WSI-1204-SFP-ATEX Series: 456,578 hrs. WSI-1204-SFP-ATEX -Extd Series: 442,020 hrs.
Warranty	5 Years

NOTE: Due to continuous improvement, all product specifications are subject to change without further notice.

Optional Accessories-Power Supply Series

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

OPTIONAL ACCESSORIES -SFP Transceiver Series

Copper SFP Transceiver Modules Series

WSFP-GC00-SG SFP to 10/100/1000Base-T(X) copper Module, 0°C ~ 70°C

WSFP-GC00-SE SFP to 1000Base-T copper Module, 0°C ~ 70°C

100Mbps Multi-mode SFP Transceiver Modules Series

WSFP-TM02 100MbpsSFPTransceiver/LC,MMF,2KM,1310nm,0°C~70°C

SWFP-TM02-T 100MbpsSFPTransceiver/LC,MMF,2KM,1310nm,-40°C~85°C

100Mbps Single-mode SFP Transceiver Modules Series

WSFP-TS20-WA	100Mbps BiDi SFP Transceiver/LC, SMF, 20KM, TX: 1310nm/RX: 1550nm, 0°C ~ 70°C
WSFP-TS20-WA-T	T 100Mbps BiDi SFP Transceiver/LC, SMF, 20KM, TX: 1310nm/RX: 1550nm, -40°C ~ 85°C
WSFP-TS20-WB	100Mbps BiDi SFP Transceiver/LC, SMF, 20KM, TX: 1550nm/RX: 1310nm, 0°C ~ 70°C
WSFP-TS20-WB-T	100Mbps BiDi SFP Transceiver/LC, SMF, 20KM, TX: 1550nm/RX: 1310nm, -40°C ~ 85°C
WSFP-TS30	100Mbps SFP Transceiver/LC, SMF, 30KM, 1310nm, 0°C ~ 70°C
WSFP-TS30-T	100Mbps SFP Transceiver/LC, SMF, 30KM, 1310nm, -40°C ~ 85°C

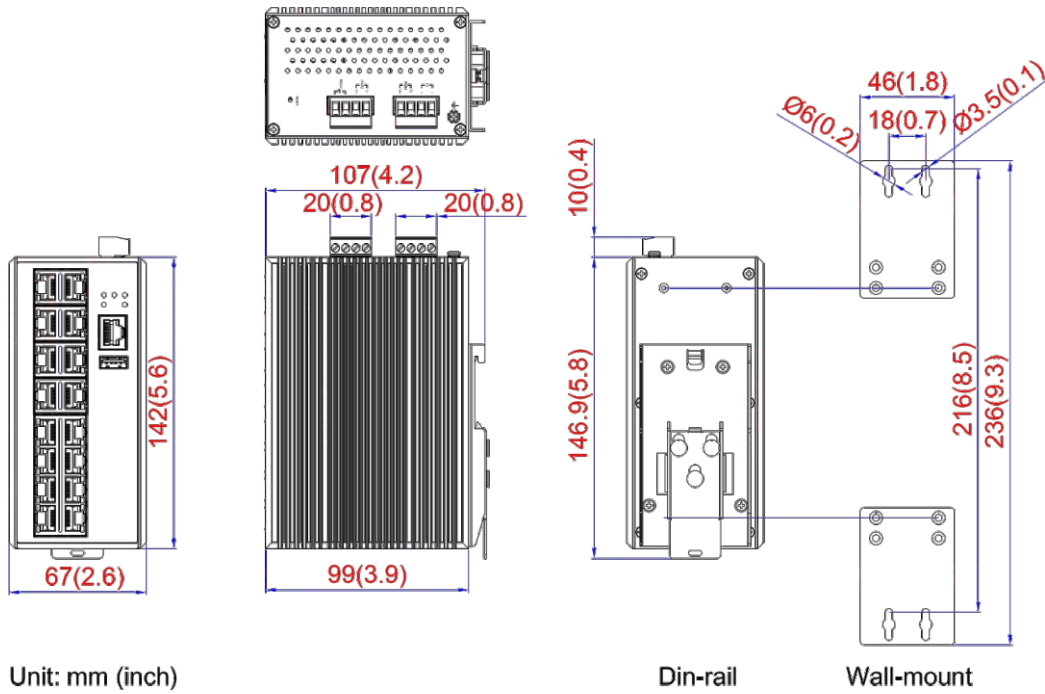
1Gbps Multi-mode SFP Transceiver Modules Series

WSFP-GM00	1Gbps SFP Transceiver/LC, MMF, 550M, 850nm, 0°C ~ 70°C
WSFP-GM00-T	1Gbps SFP Transceiver/LC, MMF, 550M, 850nm, -40°C ~ 85°C
WSFP-GM02	1Gbps SFP Transceiver/LC, MMF, 2KM, 1310nm, 0°C ~ 70°C
WSFP-GM02-T	1Gbps SFP Transceiver/LC, MMF, 2KM, 1310nm, -40°C ~ 85°C

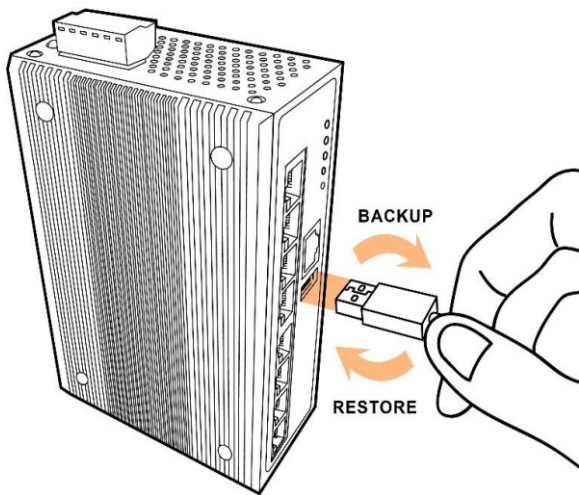
1Gbps Single-mode SFP Transceiver Modules Series

WSFP-GS10	1Gbps SFP Transceiver/LC, SMF, 10KM, 1310nm, 0°C ~ 70°C
WSFP-GS10-T	1Gbps SFP Transceiver/LC, SMF, 10KM, 1310nm, -40°C ~ 85°C
WSFP-GS10-WA	1Gbps BiDi SFP Transceiver/LC, SMF, 10KM, TX: 1310nm/RX: 1550nm, 0°C ~ 70°C
WSFP-GS10-WA-T	1Gbps BiDi SFP Transceiver/LC, SMF, 10KM, TX: 1310nm/RX: 1550nm, -40°C ~ 85°C
WSFP-GS10-WB	1Gbps BiDi SFP Transceiver/LC, SMF, 10KM, TX: 1550nm/RX: 1310nm, 0°C ~ 70°C
WSFP-GS10-WB-T	1Gbps BiDi SFP Transceiver/LC, SMF, 10KM, TX: 1550nm/RX: 1310nm, -40°C ~ 85°C
WSFP-GS20	1Gbps SFP Transceiver/LC, SMF, 20KM, 1310nm, 0°C ~ 70°C
WSFP-GS20-T	1Gbps SFP Transceiver/LC, SMF, 20KM, 1310nm, -40°C ~ 85°C
WSFP-GS40	1Gbps SFP Transceiver/LC, SMF, 40KM, 1310nm, 0°C ~ 70°C
WSFP-GS40-T	1Gbps SFP Transceiver/LC, SMF, 40KM, 1310nm, -40°C ~ 85°C
WSFP-GS40-WA	1Gbps BiDi SFP Transceiver/LC, SMF, 40KM, TX: 1310nm/RX: 1550nm, 0°C ~ 70°C
WSFP-GS40-WB	1Gbps BiDi SFP Transceiver/LC, SMF, 40KM, TX: 1550nm/RX: 1310nm, 0°C ~ 70°C
WSFP-GS60	1Gbps SFP Transceiver/LC, SMF, 60KM, 1550nm, 0°C ~ 70°C
WSFP-GS60-T	1Gbps SFP Transceiver/LC, SMF, 60KM, 1550nm, -40°C ~ 85°C
WSFP-GS60-WA	1Gbps BiDi SFP Transceiver/LC, SMF, 60KM, TX: 1310nm/RX: 1550nm, 0°C ~ 70°C
WSFP-GS60-WB	1Gbps BiDi SFP Transceiver/LC, SMF, 60KM, TX: 1550nm/RX: 1310nm, 0°C ~ 70°C
WSFP-GS80	1Gbps SFP Transceiver/LC, SMF, 80KM, 1550nm, 0°C ~ 70°C
WSFP-GS80-T	1Gbps SFP Transceiver/LC, SMF, 80KM, 1550nm, -40°C ~ 85°C
WSFP-GSH2	1Gbps SFP Transceiver/LC, SMF, 120KM, 1550nm, 0°C ~ 70°C
WSFP-GSH2-T	1Gbps SFP Transceiver/LC, SMF, 120KM, 1550nm, -40°C ~ 85°C

Dimension



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 most common USB flash drives, hugely elevating convenience for user.

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