TJ1400P-M1 Gigabit Access Switch Series

TJ1400P-M1-8TC-LS

TJ1400P-M1-8PC-LS, TJ1400P-M1-8HPC-LS

TJ1400P-M1-24TC-LS

TJ1400P-M1-24PC-LS, TJ1400P-M1-24LPC-LS

TJ1400P-M1-24S-LS-AD

TJ1400P-M1-48TS-LS

TJ1400P-M1-48PS-LS, TJ1400P-M1-48LPS-LS

Overview

The TJ1400P-M1 Gigabit switch series is a set of Layer2+ switches designed to provide a wide range of capabilities to meet diverse deployment requirements that value continuous operation. The comprehensive Layer2 feature set and management capabilities provides excellent price/performance benefit.

Network Security is paramount today and 1400P-M1 ensures that with features like authentication of Clients via 802.1x for determining the authorized devices, and security features like IP Source Guard, ACLs, Storm Control the network is secured. Additional Layer3 functionality such as Static Routing and DHCP server add to the flexibility and may eliminate the need for co-located Layer3 equipment.

The switches support line-rate, non-blocking switching for predictable performance and are AC powered. The switches are 19" Rack mountable 1RU high and the 8-port switches are designed to be 1/2RU with 2 of them fitting side-by-side in a 19" rack. Many of the switches have fan-less construction that results in no maintenance and noise-free deployment.

Power over Ethernet (PoE) capability with support for PoE+ on all ports allows some of these switches to be used to power co-located and connected equipment making it an excellent option for Surveillance and WiFi applications, indoor and outdoor.

Key Features and Benefits

Secure Network Access

Authentication of the devices that connect to the switch allows you to ensure that there is no unauthorized use of the network. This is especially true in deployments that are remote. The DHCP snooping and Dynamic ARP inspection features on the switch allow the device to reject devices trying to use an IP-address that is provided to another authorized device.

Layer2 Switching

Comprehensive Layer2 feature set with Spanning Tree Protocols to prevent loops, Link aggregation to allow for increased interconnect bandwidth, and VLAN support allows for virtualization of networks. Multicast snooping and forwarding are supported for efficient Video.

Layer3 Switching

The switches support Static Routing of IPv4 and IPv6 traffic allows aggregation at Layer3 as well. A built in DHCP server allows the switch to assign IP-addresses to endpoints and build a standalone IP-network.

Quality of Service

In converged networks multiple applications can be given their own priorities and bandwidth. Customer traffic can be limited and uplink traffic shaped as required. Note that shaping needs to ensure that adequate attention is given to the packet buffering available on the device.

Power over Ethernet

Some models offer Power over Ethernet (PoE) capability. The PoE capable switches can act as the Power Source Equipment (PSE) and deliver 30W (802.1at) of power to connected Power Devices (PD). Scheduling the powering of the devices is a feature that allows you to turn off the devices when not required.

Green Ethernet

Energy Efficient Ethernet (EEE) capability as per IEEE 802.3az on the ports allows the ports to go into a low-power inactive state and reduce power.

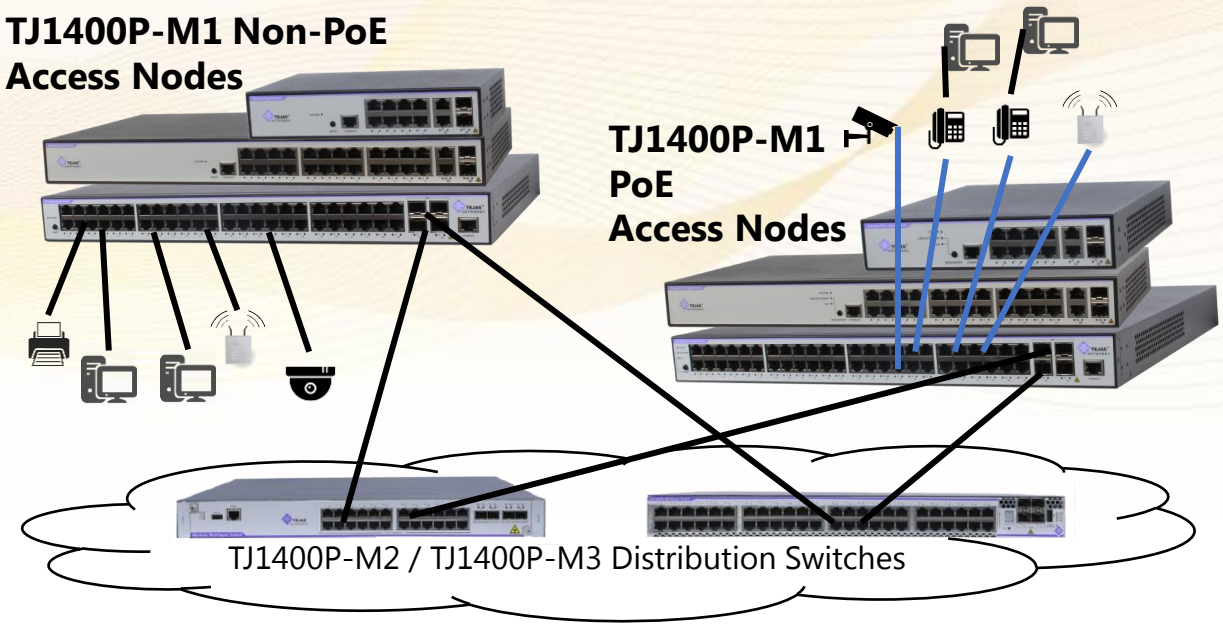
Flexible Deployments

All ports are Gigabit Ethernet ports with Auto Negotiation and MDIX support allowing for seamless interconnectivity of new and old equipment. Support of multiple uplinks allows for ring configurations for redundancy. Line rate forwarding allows high-capacity access equipment like 802.11ac Access Points. Optical ports allow for traffic to be collected at remote locations with the use of the appropriate SFP modules. Gigabit speeds reduce network latency. Jumbo frame support for Video applications

Secure Management

Management of the switch can be done locally using the console port or remotely using Secure access. A Graphical User Interface (GUI) provides easy access. Access to the switch CLI commands via RADIUS/TACACS+ ensures that all operations are authorized and logged. Traffic can also be selectively mirrored for analysis. Integration with NMS via SNMP/CLI and syslog is supported.

Sample Deployment Scenarios



Product models in this series

Aligned to the Naming convention followed in Tejas Ethernet Switches the Gigabit Switches fit the nomenclature TJ1400P-M1-XXXXXX. The "Model-Type" is the identifier XXXXXXX used to indicate the specific orderable switch which is a combination of port capabilities and software described here

Model-ID XXXXXXX	RJ45 Ports 10/100/1000	PoE+ Capable	PoE Budget	RJ45 Uplink	SFP Uplink	Software Feature Set
8TC-LS	8			2 Combo (RJ45/SFP)		Layer2+
8PC-LS	8	8	130W	2 Combo (RJ45/SFP)		Layer2+
8HPC-LS	8	8	250W	2 Combo (RJ45/SFP)		Layer2+
24TC-LS	24			2 Combo (RJ45/SFP)		Layer2+
24PC-LS	24	24	380W	2 Combo (RJ45/SFP)		Layer2+
24LPC-LS	24	24	185W	2 Combo (RJ45/SFP)		Layer2+
24S-LS	4 Combo				20+4 Combo	Layer2+
48TS-LS	48				4	Layer2+
48PS-LS	48	48	740W		4	Layer2+
48LPS-LS	48	48	370W		4	Layer2+

Power Supply

All the switches have a wide range (90-240V, 50-60Hz) AC input in the rear and a console port for local access.
The Fiber Aggregation switch, TJ1400P-M1-24S-LS-AD, has a second built-in 48V DC power supply

Hardware Characteristics

Model-ID XXXXXXX	Dimension (HxWxD) mm	Weight gms	MTBF hours	Processor	DRAM	Flash
8TC-LS	44x220x123	1.0Kg	595,830	416MHz ARM	128 MB	32MB
8PC-LS	44x220x242	2.1Kg	583,120	416MHz ARM	128 MB	32MB
8HPC-LS	44x220x242	2.1Kg	590,230	416MHz ARM	128 MB	32MB
24TC-LS	44x442x211	2.6Kg	463,000	416MHz ARM	128 MB	32MB
24PC-LS	44x442x211	3.5Kg	336,970	416MHz ARM	128 MB	32MB
24LPC-LS	44x442x211	3.3Kg	266,510	416MHz ARM	128 MB	32MB
24S-LS	44x442x211	3.1Kg	250,990	416MHz ARM	128 MB	32MB
48TS-LS	44x442x300	4.2Kg	262,880	500MHz ARM	512 MB	160 MB
48PS-LS	44x442x375	5.6Kg	150,820	500MHz ARM	512 MB	160 MB
48LPS-LS	44x442x375	5.0Kg	156,650	500MHz ARM	512 MB	160 MB

Switch Scalability

Model-ID XXXXXXX	Switching Capacity	Forwarding Rate (64B)	MAC Table	Packet Buffer	VLAN support	Max Frame Size
8TC-LS	20 Gbps	14.88 Mpps	8K	512 KB	4096	9216 Bytes
8PC-LS	20 Gbps	14.88 Mpps	8K	512 KB	4096	9216 Bytes
8HPC-LS	20 Gbps	14.88 Mpps	8K	512 KB	4096	9216 Bytes
24TC-LS	52 Gbps	38.7 Mpps	8K	512 KB	4096	9216 Bytes
24PC-LS	52 Gbps	38.7 Mpps	8K	512 KB	4096	9216 Bytes
24LPC-LS	52 Gbps	38.7 Mpps	8K	512 KB	4096	9216 Bytes
24S-LS	48 Gbps	35.7 Mpps	32K	4 MB	4096	10056 Bytes
48TS-LS	104 Gbps	77.38 Mpps	32K	2 MB	4096	10056 Bytes
48PS-LS	104 Gbps	77.38 Mpps	32K	2 MB	4096	10056 Bytes
48LPS-LS	104 Gbps	77.38 Mpps	32K	2 MB	4096	10056 Bytes

Power Consumption and Acoustics

Model-ID XXXXXXX	No Load	Under Full Load (30W / port)	Acoustic
8TC-LS	4.0 W	8.2 W	Fanless
8PC-LS	6.8 W	153.5 W	Fanless
8HPC-LS	8.1 W	245.4 W	Fan x1
24TC-LS	10.3 W	22.1 W	Fanless
24PC-LS	23.6 W	411.8 W	Fan x2
24LPC-LS	14.3W	206.9 W	Fan x1
24S-LS	10.3W	21.3 W	
48TS-LS	20.3W	42.5W	Fan x2
48PS-LS	40.7W	855.9W	Blower x1
48LPS-LS	33.3W	442.0W	Blower x1

LED Indicators

LED	Color	State	Description
SYSTEM	Green	On	The switch is Powered on correctly
		Off	The switch is not receiving power
Link/Act/Status Mode	Green	On	The port LEDs display link/Act/Status
PoE Mode	Green	On	The port LEDs display PoE Status

The Mode button can be used to change the information displayed by the Port LEDs

LED	Color	State	Description
Port LED Link/Act /Status Mode	Green	On	Port is connected and speed is 1000 Mbps
	Amber	On	Port is connected and speed is 10 Mbps
	-	Blinking	Port is transmitting and receiving packets
		Off	Port is disconnected or disabled
Port LED PoE Mode	Green	On	Port is supplying PoE Power
	Amber	On	Abnormal State (overload) detected by switch
	-	Off	Port is not connected to PD or disabled
SFP Ports	Green	On	Port is connected and speed is 1000 Mbps
	Amber	On	Port is connected and speed is 10 Mbps
	-	Blinking	Port is transmitting and receiving packets
		Off	Port is disconnected or disabled

Environmental Range

Operating Temperature	0 degC to +50 degC
Storage Temperature	-40 degC to +85 degC
Operating Altitude	< 3000 meters
Operating Humidity	0% to 95% non-condensing

Certifications and Compliances

Safety	CE, EN60950-1
EMI	FCC Part 15 Subpart B, Class A EN61000-6-4 compliant EN55022, EN55011
EMC	EN61000-4-2 for ESD : Electrostatic discharge EN61000-4-3 for RS : Radiated susceptibility EN61000-4-4 for EFT : Electrical Fast Transient EN61000-4-5 for Surge EN61000-4-6 for CS : Conducted susceptibility EN61000-4-8 for PFMF : Power frequency magnetic field

Networking and Software Features

Layer 3 Switching	
Static Routing	• IPv4 Unicast Static Routing (up to 64 routes) • IPv6 Unicast Static Routing (up to 64 routes)
Layer2 Switching	
Bridging	• Dynamic Learning of MAC addresses with notification of MAC address change and configurable Aging Timers • Static MAC addresses that are not subject to aging
Spanning Tree Protocol (STP)	• Standard Spanning Tree 802.1d • Rapid Spanning Tree (RSTP) 802.1w • Multiple Spanning Tree (MSTP) 802.1s (up to 8 instances) • PortFast, BPDU Filter, Root Guard, Loop Guard • BPDU Guard, Error Recovery for enabling disabled link
Link Aggregation	• Link bonding using statically defined Link Aggregation Groups • Dynamic bonding using Link Aggregation Control Protocol (LACP) IEEE 802.3ad • Up to 5/13/26 link aggregation groups each with up to 4 members
VLAN support	• Port-based VLAN • 802.1Q tag-based VLAN • MAC-based VLAN • Protocol-based VLAN • Management VLAN • Private VLAN Edge (PVE) • Q-in-Q (double tag) VLAN • Voice VLAN • GARP VLAN Registration Protocol (GVRP) for propagating VLAN
UDLD	Unidirectional Link Detection to discover L2 mis-connections
IGMP Snooping and Filtering	• Snooping and filtering of IGMP v1/v2/v3 requests to deliver the bandwidth intensive IPv4 multicast traffic only to the requesters • Supports 256 groups
MLD Snooping and Filtering	Delivers IPv6 multicast packets only to the required receivers
IGMP Querier	IGMP querier is used to support a Layer 2 multicast domain of snooping switches in the absence of a multicast router
IGMP Proxy	IGMP snooping with proxy reporting or report suppression actively filters IGMP packets in order to reduce load on the multicast router
Multicast VLAN Registration (MVR)	It uses a dedicated manually configured VLAN, called the multicast VLAN, to forward multicast traffic over Layer 2 network in conjunction with IGMP snooping.
DHCP Relay	• Relay of DHCP traffic to DHCP server in different VLAN. • Works with DHCP Option 82

Security	
Secure Shell (SSH)	SSHv1 and SSHv2 are supported for secure remote access to the switch
Secure Socket Layer (SSL)	The browser based access to the switch is secured by encrypting the http traffic using SSL
802.1X	• IEEE802.1X: RADIUS authentication, authorization and accounting, MD5 hash, guest VLAN, single/multiple host mode and single/multiple sessions • Supports IGMP-RADIUS based 802.1X • Dynamic VLAN assignment
Private VLAN Edge	PVE (also known as protected ports) provides L2 isolation between clients in the same VLAN. Supports multiple uplinks
Port Security	Locks MAC addresses to ports, and limits the number of learned MAC address
IP Source Guard	Prevents illegal IP address from accessing specific port in the switch. Only IP-MAC address bindings that are verified are allowed
Dynamic ARP Inspection	The switch compares the ARP request received dynamically against the IP-MAC address bindings that are allowed and discards any illegal ARP requests.
RADIUS/TACACS+	The switch act as a RADIUS/TACACS+ client
Storm Control	Prevents traffic on a LAN from being disrupted by a broadcast, multicast, or unicast storm of unknown MAC addresses on a port
DHCP Snooping	The switch can snoop DHCP requests so it knows the responses from a trusted DHCP server and can use it to build IP-MAC bindings to enforce security policies
ACLs	Supports up to 64 entries. Drop or rate limitation based on: • Source-Destination MAC, VLAN ID or IP address, protocol, port, • Differentiated services code point (DSCP) / IP precedence • TCP/ UDP source and destination ports • 802.1p priority • Ethernet type • Internet Control Message Protocol (ICMP) packets • TCP flag
Loop Protection	Prevents unknown unicast, broadcast and multicast loops in Layer 2 switching configurations.

Quality of Service	
Queuing Hardware	Supports 8 Queues per Port
Scheduling Disciplines	• Strict Priority • Weighted Round Robin (WRR)
Congestion Control	Weighted Random Early Discard (WRED) on per Queue basis
Classification	Queue assignment based on • Port based • 802.1p VLAN priority based • IPv4/IPv6 precedence / DSCP based • Differentiated Services (DiffServ) • Classification and re-marking ACLs
Bandwidth Control	• Ingress Policer and marking (per port, and per Queue) • Egress Shaper and Rate Control (per port, and per Queue)
Management	
HW Monitoring	High Temperature Detection and Alarm
HW Watchdog	CPU Hang events are detected and SW restarted
DHCP Server	The built-in DHCP Server can be enabled to give out IP addresses to connected hosts.
Remote Monitoring (RMON)	Embedded RMON agent supports RMON groups 1,2,3,9 (history, statistics, alarms, and events) for enhanced traffic management, monitoring and analysis
Port Mirroring	Traffic on a port (Ingress, Egress, Both) can be mirrored to another port for analysis with a network analyzer or RMON probe. Up to N-1 (N is Switch's Ports) ports can be mirrored to single destination port.
S-Flow	The switch allows traffic to be sampled and sent to a server for monitoring.
Auto Discovery (LLDP)	Using IEEE 802.1an, the network devices advertise their identities, capabilities, and neighbors on an IEEE 802ab local area network. The switch support LLDP-MED extensions for client capabilities
SW Upgrades	Dual Images are supported. Independent primary and secondary images for backup while upgrading. Software upgrade via Web Browser (HTTP/HTTPS) and via File transfer (TFTP/FTP)

Firmware Upgrade	Firmware is upgradable via Web Browser or local console port
SNMP	SNMP version1, 2c and 3 with support for traps. For enhanced security, SNMP version 3 user-based security model (USM)
Syslog	The events generated by the switch can be selected to be sent to a syslog server for further analysis and persistent storage
CLI	An Industry standard (Cisco-like) Command Line Interface (CLI) is available to configure and operate the switches. Configuration rollback to saved configuration is supported.
GUI – Graphical User Interface	A Web-server is embedded in the device and the switch can also be operated from a use-friendly Browser based User Interface
NTP	The switch does not have a persistent Real-time Clock (RTC) and hence it uses Network Time Protocol (NTP) as per RFC 1305 to get clock information
Cable Diagnostics	The Electrical interfaces support cable diagnostics to identify the location of the fault
Optical Port Monitoring	The Optical characteristics of the SFP modules can be monitored
TraceRoute	Layer3 and Layer2 Trace Route capability
IPv6 Management	The Management interface and utilities are IPv6 compliant. The Node IP address can be IPv6 and the Management traffic can be IPv6 based.
Power over Ethernet (PoE) for models where applicable	
Port Configuration	Supports per-Port PoE configuration
PoE Scheduling	Allows the PoE Devices (PDs) to be turned on/off as required
Auto Checking	Allows the PoE Devices (PDs) to be rebooted if the do not respond to a ping from the switch
Power Delay	The switch allows the PD's to be switched on following a programmable delay after rebooting. This allows the network to be established prior to powering the PoE Devices.
Persistent Power	This feature allows the PD's to retain power in case the switch undergoes a reboot. This allows PoE Devices with built in storage to continue operation and sync up on network availability.

Standards Support

Ethernet	IEEE 802.3
Physical Layer	IEEE 802.3u, 802.3.z, 802.3ab
Flow Control	IEEE 802.3x
Framing/QoS	IEEE 802.1Q, 802.1ad, 802.1p, 802.1ac, 802.1v
Discovery	IEEE 802.1b
Bonding/Trunking	IEEE 802.3ad
PoE	IEEE 802.3af, 802.3at
Energy Efficient	IEEE 802.3az
STP	IEEE 802.1d, 802.1w, 802.1s, 802.1D-2004
Security	IEEE 802.1X

Ordering Information

TJ1400P-M1-8TC-LS	8-port L2+ Managed GbE Switch with Combo Uplinks and AC input
TJ1400P-M1-8PC-LS	8-port L2+ Managed GbE PoE+ Switch with Combo Uplinks and AC input
TJ1400P-M1-8HPC-LS	8-port L2+ Managed GbE High wattage PoE+ Switch with Combo Uplinks and AC input
TJ1400P-M1-24TC-LS	24 port L2+ Managed GbE Switch with Combo Uplinks and AC input
TJ1400P-M1-24PC-LS	24 port L2+ Managed GbE PoE+ Switch with Combo Uplinks and AC input
TJ1400P-M1-24LPC-LS	24 port L2+ Managed GbE Low wattage PoE+ Switch with Combo Uplinks and AC input
TJ1400P-M1-24S-LS -AD	24 port L2+ Managed GbE Fiber Switch and AC and DC input
TJ1400P-M1-48TS-LS	48 port L2+ Managed GbE Switch with 4 SFP/SFP+ uplink ports and AC input
TJ1400P-M1-48PS-LS	48 port L2+ Managed GbE PoE+ Switch with 4 SFP uplink ports and AC input
TJ1400P-M1-48LPS-LS	48 port L2+ Managed GbE Low wattage PoE+ Switch with 4 SFP uplink ports and AC input

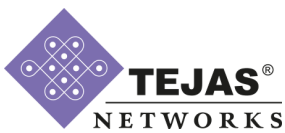
All switches ship with Mounting Kit for 19" racks and 3-pin (India) power cable of 3meter length. A Console Cable for the switch is also supplied as part of the orderable part.

Pluggable Interface Modules

The Optical Interfaces use Pluggable Optical modules compliant with IEEE Standards and the Multi Source Agreements (MSA). However, Tejas recommends that the Optical modules be ordered from Tejas as this ensures that the modules have been tested for Quality and functionality in Tejas equipment and their operation and performance is guaranteed. When a customer sources and installs optical modules without the consent of Tejas Networks, any network failure is not supported by Tejas.

The following pluggable Interface modules may be ordered

Gigabit Ethernet Pluggable SFP Modules	
TJ-SFP-1GE-T	IEEE 1000BASE-T, Cat 6 cable, RJ45
TJ-SFP-1GE-SX	IEEE 1000BASE-SX, 850nm, Multi-Mode OM3, 550m, 2xLC
TJ-SFP-1GE-LX	IEEE 1000BASE-LX, 1310nm, Single Mode, 10Km, 2xLC
TJ-SFP-1GE-LX-BI-U	IEEE 1000BASE-BX10, 1310nm-TX/1490nm-RX, 10Km, LC
TJ-SFP-1GE-LX-BI-D	IEEE 1000BASE-BX10, 1490nm-TX/1310nm-RX, 10Km, LC
TJ-SFP-1GE-LH	IEEE 1000BASE-LH, 1310nm, Single Mode, 40Km, 2xLC
TJ-SFP-1GE-ZX	IEEE 1000BASE-ZX, 1550nm, Single Mode, 80Km, 2xLC



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