

TEJAS[®]
NETWORKS

TJ1400P-M2 L2/L3 10G Distribution Switches

TJ1400P-M2-24TD-LS/S
TJ1400P-M2-24HPD-LS/S



TJ1400P-M2-24SD-LS/S



Overview

The TJ1400P-M2 Modular Multi-layer Distribution switch series is designed to provide a wide range of capabilities to meet diverse deployment requirements that value continuous operation and comprehensive Layer2, Carrier Ethernet, and Layer3 features, flexibility of PoE/PoE+, non-PoE and Optical Interfaces, and management capabilities.

Switches run TejNOS-EN software that provides flexible licensing options. The 1400P-M2 can also be used in a service provider network by ordering the -S models that adds Carrier Ethernet and IP Routing capability. Service OAM and Performance monitoring, along with 50-ms protection using ERPS are useful in operator networks and in campus networks. Inter VLAN routing using Layer3 protocols for Unicast and Multicast IPv4 and IPv6 traffic.

The switch construction supports redundant, field replaceable, rear power supplies and 19" rack mounting with 1RU height. The Fan tray is also field-replaceable providing for enhanced

availability. The Power supply units can be tailored to the deployment needs and higher operating temperature.

Network Security is paramount today and 1400P-M2 ensures that with features like ACLs based on L2-L4 headers, Storm Control, Denial of Service (DoS) mitigation the network security is not compromised. In addition, at Layer2 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.

The switches support line-rate, non-blocking switching for predictable performance. Quality of Service is important in the distribution switches and the TJ1400P-M2 supports a rich set of QoS capabilities.

The PoE configurations support up to 30W on all ports. The 4xSFP/SFP+ provide higher uplink capacity and/or stacking capacity of 40Gbps/80Gbps.

Key Features and Benefits

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. Ethernet Ring Protection and Carrier Ethernet features for Service Providers.

Layer3 Switching

The switches support IP routing with RIP and OSPF in addition to static routing. For Multicast the switch supports PIM. As with all modern switches, both IPv4 and IPv6 lookups are supported in hardware for line rate forwarding of IP traffic. 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/Application traffic can be limited and uplink traffic can be shaped as required. Note that shaping needs to ensure that adequate attention is given to the packet buffering available on the device.

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 works in conjunction with a RADIUS server. 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.

Power over Ethernet

Specific models offer Power over Ethernet (PoE) capability. The PoE capable switches can act as the Power Source Equipment (PSE) and deliver 15.4W (IEEE 802.3af) / 30W (IEEE 802.3at) of power to connected Powered Devices (PD). With LLDP-MED capability the PD's can negotiate the power with the switch. Scheduling the powering of the devices is a feature that allows you to turn off the devices when not required.

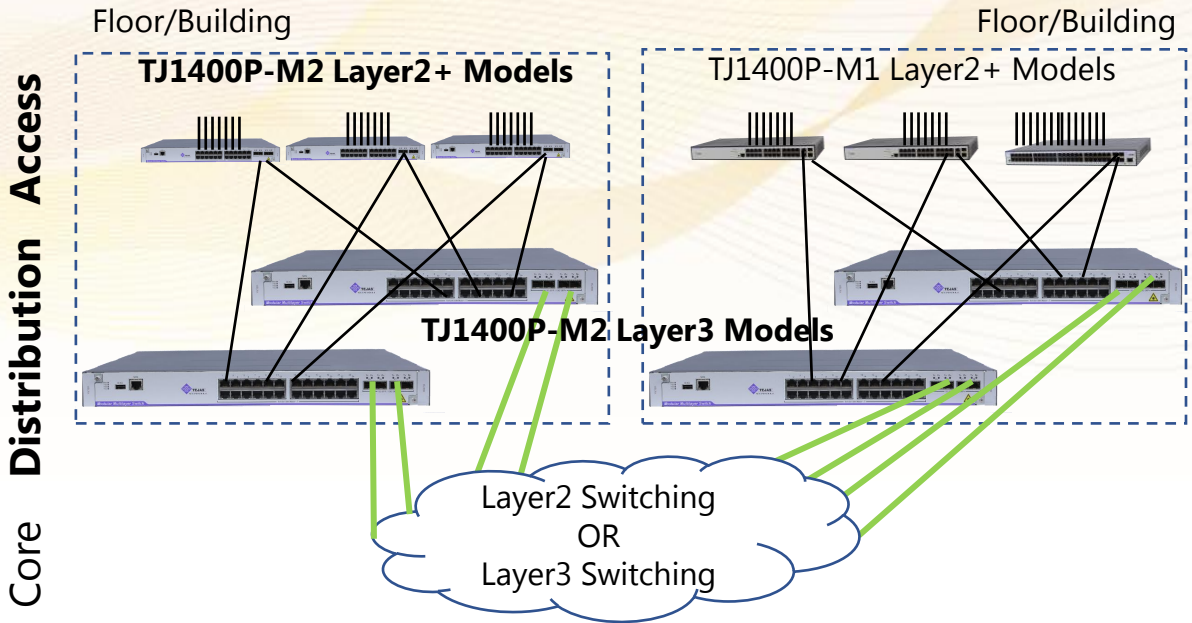
Flexible Deployments

All ports are Gigabit Ethernet ports with Auto Negotiation and MDIX support allowing for seamless interconnectivity of new and old equipment. Legacy support of 10/100 Half-Duplex is also supported. 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 as Access/Distribution



Product models in this series

The switches fit nomenclature TJ1400P-M2-XXXXXX. The "Model-Type" is the identifier XXXXXXXX used to indicate the specific orderable switch which is a combination of port capabilities and software license of the TejNOS-EN supported.

Model-ID XXXXXX	RJ45 Ports 10/100/1000	PoE+ Capable	PoE Budget	SFP Ports	SFP/SFP+ Ports	Software Feature Set
24TD-LS	24	-	-	-	4	Layer2+
24TD-S						IP-Base
24HPD-LS	24	24	740W	-	4	Layer2+
24HPD-S						IP-Base
24SD-LS	-	-	-	24	4	Layer2+
24SD-S						IP-Base

10G ports can also be used for Stacking up to 8 switches. Stacking bandwidth is 40Gbps (2 Stack ports) or 80G (4 stack ports). Different models, optical and Electrical, can be stacked together to meet customers need of client ports and Uplink bandwidth.

Hardware Characteristics

Hardware Characteristics of Models with Electrical and Optical Client ports are as under. Switches are 19" rack mountable , with adjustable rear mount kit for use with 640mm and 740mm depth racks.

Hardware Parameter	24TD-LS, 24TD-S, 24HPD-LS, 24HPD-S	24SD-LS, 24SD-S
Dimension (HxWxD)	44 mm x 443 mm x 468 mm	
Weight (Dual PSU)	9 Kg	9 Kg
MTBF	292,000 hours	250,000 hours
Processor	External Processor, 1GHz, 2 GB DRAM, 512+ MB Flash	
Management Ports	Front access for Serial Console and NMS Ethernet Port	
Power Solution	Dual, Rear Access, Field Replaceable Power Supply Units AC PSU Specification: 90-140V/180-264V AC, 47-63 Hz	
Thermal Solution	Rear access, Hot Swap Fan Tray with 2+1 fan redundancy	

Switch Scalability

The scaling numbers are maximum supported with the available ports. Feature scalability is the capabilities of the platform and is available in a release of TejNOS-EN software.

Networking Parameter	24TD-LS, 24TD-S, 24HPD-LS, 24HPD-S, 24SD-LS, 24SD-S
Switching Capacity	128 Gbps
Forwarding Rate (64B)	95.23 MPPS
Max Frame Size	13 KByte
Packet Buffer	Internal, 16Mb (2 MegaByte)
MAC Address	32K
VLAN Support	4K
IP Host Table	8K IPv4 Host Addresses, 4K IPv6 Host Addresses
IP Route Table	12K IPv4 Routes, 6K IPv6 Route entries
Multicast	1K L2 Groups, 4K IPv4 Groups, 2 K IPv6 Groups
Classification Rules	2K Ingress, 512 Egress (for ACL, Metering, Statistics)

System LED Indicators

LED	Color	State	Description
PWR (Power)	Green	On	PSU's are providing output voltage
		Off	Absence of power of the node
STS (Status)	Green	On	The switch is Operational
	Red	On	Node rebooting continuously, software crash
FAN	Green	On	All fans operating normal
	Red	On	Fan failure in system or temperature out of range
PoE		Off	PoE is not enabled
	Amber	On	No Power Device (PD) is connected
	Green	On	PoE enabled, supplying power to the connected Power Device within Limit
	Red	On	Power drawn by PDs exceeds PSU limit

Electrical Port LEDs

LED	Color	State	Description
Port Link/Act/Status LED	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 PoE LED	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

Optical Port LEDs

LED	Color	State	Description
Tx LED	Green	On	SFP Laser is ON
		Off	SFP Laser is off
Rx LED	Amber	On	Module is Not present, or present with LOS
	Green	On	Module is present with no LOS
	Red	On	There is a fault in the SFP

Environmental Range

Operating Temperature	0 degC to +50 degC (Guaranteed)/+55 degC (Workable)
Storage Temperature	-40 degC to +70 degC
Operating Altitude	Up to 3000 meters
Operating Humidity	0% to 95% non-condensing

Certifications and Compliances

Safety	CE Marking: LVD Directive 2014/35/EU IEC 60950-1 / EN 60950-1 UL 60950-1 CAN/CSA-C22.2 No. 60950-1
EMI	CE Marking: EMC Directive 2014/30/EU FCC Part-15, Subpart B, Class-A ICES-003, Class-A EN 300386 CISPR-22/CISPR32 Class-A, EN55022/EN55032 Class-A CISPR-24, EN55024 IEC/EN 61000-3-2 & IEC/EN 61000-3-3 (applicable to AC power supply products)
EMC	CE Marking: EMC Directive 2014/30/EU IEC/EN61000-4-2 for ESD : Electrostatic discharge IEC/EN61000-4-3 for RS : Radiated susceptibility IEC/EN61000-4-4 for EFT : Electrical Fast Transient IEC/EN61000-4-5 for Surge IEC/EN61000-4-6 for CS : Conducted susceptibility IEC/EN61000-4-8 for PFMF : Power frequency magnetic field IEC/EN61000-4-11 for Voltage dips and Short interruption (applicable to AC power supply products)
Environmental	RoHS Directive 2011/65/EU

TejNOS-EN Software Features

-LS Feature License (Layer2 Switching and Static Routing)	
Layer3 Features available under –LS License	
Static Routing	<ul style="list-style-type: none"> • IPv4 and IPv6 Static Routing capable • Policy Based Static Routes based on Classification rules • Up to 1K Static Route entries
DHCP Server	The built-in DHCP Server can be enabled to give out IP addresses to connected hosts
DHCP Relay	<ul style="list-style-type: none"> • Relay of DHCP traffic to DHCP server in different VLAN • Works with DHCP Option 82
Layer2 Features	
Bridging	<ul style="list-style-type: none"> • Dynamic Learning of MAC addresses with configurable Aging Timers and MAC Table notification • Static MAC addresses that are not subject to aging (20 per port)
Spanning Tree Protocol (STP)	<ul style="list-style-type: none"> • Standard Spanning Tree 802.1D • Rapid Spanning Tree (RSTP) 802.1w • Multiple Spanning Tree (MSTP) 802.1s, up to 32 instances • BPDU Filter, Root Guard, Loop Guard, BPDU Guard • Standard SNMP Spanning Tree MIB support
Link Aggregation	<ul style="list-style-type: none"> • Link bonding using statically defined Link Aggregation Groups • Dynamic bonding using Link Aggregation Control Protocol (LACP) IEEE 802.3ad • Up to 64 link aggregation groups each with up to 8 members • Hash based trunk selection
VLAN support	<ul style="list-style-type: none"> • 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
Centralized VLAN Management	Supports MVRP (Multiple VLAN Registration Protocol) and GVRP (Generic VLAN Registration Protocol) to dynamically propagate VLAN information to eliminate VLAN configuration errors
IGMP Snooping	Supports snooping of IGMP v2 and IGM v3 requests to deliver the bandwidth intensive IPv4 multicast traffic only to the requesters. Supports 1K IGMP Groups.
MLD Snooping	Delivers IPv6 multicast packets only to the required receivers by snooping IPv6 MLD v1, MLD v2 requests. Supports 1K MLD groups.

IGMP Querier	IGMP querier is available 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
-S Feature License (Metro and IP-Base feature set upgrade over -LS)	
Metro Features included in the -S License	
Ring Protection	50-ms protection using ERPS as per ITU-T G.8032 12 instances of ERPS are supported across ports/VLANs
Ethernet OAM	Ethernet in First Mile (EFM) IEEE 802.3ah. Up to 24 OAM entries
Service OAM	Connectivity Fault Management (CFM) IEEE 802.1ag 8 domains, 256 Maintenance Associations per domains Up to 512 Maintenance End Points (MEPs)
Perf. Monitoring	Delay and Loss Measurement (DM, LM) as per ITU-T Y.1731
L2 Protocol Tunnelling	Specific protocols can be tunneled through the Service Provider Network
Routing Features included in the -S License	
RIP	RIPv1/v2 for IPv4, RIP-ng for IPv6
OSPFv2, OSPFv3	Open Shortest Path First (OSPF) for IPv4 and IPv6
PIM	Protocol Independent Multicast (PIM), PIM-SM, PIM-SSM
ECMP	Equal Cost Multi-path for Load balancing/protection
MLD	Multicast Listener Discovery for IPv6
VRRP	Virtual Router Redundancy Protocol for node failover

Security (for all Software licenses : -LS, -S)	
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 support	<ul style="list-style-type: none"> • IEEE 802.1x: Up to 16 clients per port • RADIUS authentication, authorization and accounting, MD5 hash, guest VLAN • Single/multiple host mode and single/multiple session • 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	Ability to locks MAC addresses to ports. Ability to limit the number of learned MAC address per port/VLAN
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 on a port. Port can be put into err_disable state on detection of storm event.
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 256 entries in current release of TejNOS-EN Actions of Allow, Drop, rate limitation, mirror based on: <ul style="list-style-type: none"> • 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
Denial of Service Mitigation	<ul style="list-style-type: none"> • Hardware support for various DoS attacks like: illegal address check (IPv4, IPv6), Land packets (SIP = DIP), NullScan (TCP sequence number = 0, control bits = 0), Ping flood (flood of IPMC packets), SYN/SYN-ACK flooding, SYN with sPort < 1024, Smurf attack, Individual control over handling of DoS packet • Fine Control of CPU bound traffic using 48 queues

Quality of Service (for all Software licenses : -LS, -S)	
Queuing Hardware	Supports 8 Queues per Port
Scheduling Disciplines	<ul style="list-style-type: none"> • Strict Priority • Weighted Round Robin (WRR) • Weighted Deficit Round Robin (WDRR)
Congestion	<ul style="list-style-type: none"> • Random Early Detection (RED) and Weighted Random Early Detection (WRED) active queue management • Explicit Congestion Notification (ECN) support
Classification	Queue assignment based on <ul style="list-style-type: none"> • Port based • 802.1p VLAN priority based • IPv4/IPv6 precedence / DSCP based • Differentiated Services (DiffServ) • Classification and re-marking ACLs
Bandwidth Control	<ul style="list-style-type: none"> • Ingress Policer and marking (per port, and per Queue) • Egress Shaper and Rate Control (per port, and per Queue)
Management (for all Software licenses : -LS, -S)	
HW Monitoring	High Temperature and Hardware failure Detection and Alarms
HW Watchdog	CPU Hang events are detected and SW restarted
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 can be mirrored to another port for analysis with a network analyzer or RMON probe. Up to N-1 (N is number of switch 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 and SNMP notifications on change in LLDP database
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 and access to ALL device information and Standard MIBS For enhanced security, SNMPv3 user-based security model (USM)
Local Logging	Switch supports local store of Logs in NVRAM for debugging and forensics of failures and events
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
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 has Network Time Protocol (NTP) Client to sync to network 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
Dual Stack Management	The Management interface and utilities are IPv6 compliant. The Node IP address can be IPv4 or IPv6 with dual stack support.
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 they 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 software 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, 802.3ac, 802.3ae
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
STP	IEEE 802.1d, 802.1w, 802.1s, 802.1D-2004
Security	IEEE 802.1x
Carrier Ethernet	ITU-T G.8032 v2, IEEE 802.3ah, IEEE 802.1ag, ITU-T Y.1731
MEF	MEF-9 and MEF-14
System Support	<p> RFC 768 UDP RFC 783 TFTP RFC 791 IP RFC 792 ICMP RFC 793 TCP RFC 826 ARP RFC 903 RARP RFC 854 Telnet RFC 906 TFTP Bootstrap RFC 951, 1542 BootP RFC 1027 Proxy ARP, RFC 1519 CIDR RFC 1591 DNS RFC 2131, 2132 DHCP RFC 1256 IPv4 ICMP Router Discovery (IRDP) IPv6 via RFC 2460, RFC 1981, RFC 4443, RFC 4861, RFC 4862 RFC 2068 HTTP server RFC 2030 SNTP, Simple Network Time Protocol RFC 2131 BOOTP/DHCP relay agent and DHCP server RFC 1492 TACACS+ RFC 2138 RADIUS Authentication RFC 2139 RADIUS Accounting RFC 3579 RADIUS EAP support for 802.1x RFC 5176 Dynamic Authorization Extensions to RADIUS </p>
RIP	RFC 1058 RIP v1, RFC 2453 RIP v2
OSPF	<p> RFC 2328 OSPF v2 (Edge-mode) RFC 1587 / RFC 3101 OSPF NSSA Option RFC 2154 OSPF w/Digital Signatures (Password, MD-5) RFC 2370 OSPF Opaque LSA Option RFC 5340 OSPFv3 </p>
Multicast Related	<p> RFC 1112 IGMP v1 RFC 2236 IGMP v2 RFC 3376 IGMP v3 RFC 3618 MSDP - Multicast Source Discovery Protocol RFC 2362 PIM-SM (Edge-mode) draft-ietf-ssm-arch-06.txt PIM-SSM PIM Source Specific Multicast </p>

Ordering Information*

* Optical Modules and Redundant PSUs have to be ordered as per deployment requirements

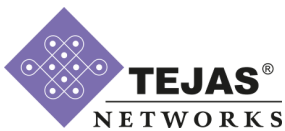
TJ1400P-M2-24TD-LS	TJ1400P-M2-24TD-LS : 24 Port 10/100/1000 Mbps RJ45 and 4 x 1/10G SFP+ with single PSU and Layer2+ Software and Installation Kit
TJ1400P-M2-24TD-S	TJ1400P-M2-24TD-S : 24 Port 10/100/1000 Mbps RJ45 and 4 x 1/10G SFP+ with single PSU and IP-Base Software and Installation Kit
TJ1400P-M2-24HPD-LS	TJ1400P-M2-24HPD-LS : 24 PoE Port 10/100/1000 Mbps RJ45 and 4 x 1/10G SFP+ with single 740W PoE PSU and Layer2+ Software and Installation Kit
TJ1400P-M2-24HPD-S	TJ1400P-M2-24HPD-S : 24 PoE Port 10/100/1000 Mbps RJ45 and 4 x 1/10G SFP+ with single 740W PoE PSU and IP-Base Software and Installation Kit
TJ1400P-M2-24SD-LS	TJ1400P-M2-24SD-LS : 24 Port SFP GigE and 4 x 1/10G SFP+ with single PSU and Layer2+ Software and Installation Kit
TJ1400P-M2-24SD-S	TJ1400P-M2-24SD-S : 24 Port SFP GigE and 4 x 1/10G SFP+ with single PSU and IP-Base Software and Installation Kit
TJ1400P-M2-SW-UPG-LIC-S	TJ1400P-M2 IP-Base Software Upgrade License: Upgrades the node software from Layer2+ to CE and Layer3 Basic (IP-Base)
TJ1400P-M2M3-AC-POE-740W-PSU	TJ1400P-M2M3-AC-POE-740W-PSU : AC PSU for TJ1400P-M2 and TJ1400P-M3 switches delivering internal 12V and 740W of PoE power along with 3m AC power cord for India for Redundant Systems and Sparing
TJ1400P-M2-FTU	TJ1400P-M2-FTU: Fan tray unit for the TJ1400P-M2 for sparing
TJ1400P-M2-FFU	TJ1400P-M2-FFU: Fan Filter for the TJ1400P-M2 for sparing
TJ1400P-M2-INS	Installation Kit for TJ1400P-M2 switches for sparing. Includes Mounting Kit, Diag Cable, 2m NMS Ethernet cable, 3m AC power cord for India.

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
10 Gigabit Ethernet Pluggable SFP+ Modules	
TJ-SFP-10GE-SX	IEEE 10GBASE-SR, Multi-Mode OM3, 300m, 2xLC
TJ-SFP-10GE-LX	IEEE 10GBASE-LR, Single Mode, 10Km, 2xLC
TJ-SFP-10GE-LH	IEEE 10GBASE-ER, Single Mode, 40Km, 2xLC



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