



# Opti-X 2x10GX

## Dual Port 10Gbp/s ( XFP ) MPLS Layer-3 Module

Opti-x 2x10GX is a Dual port 10GigE Optical module: Dedicated for use on the OptiCore 400 / 800 chassis, this module Provides two high speed Optical (XFP) redundant network access connections to the optical network. This module will permit full Non-blocking connectivity to any other access module such as the Opti-x 12GX, 24GT, 24GX 48GT or 48GX module.

### Hardware Specifications

Switch Layer 2	Wire Speed
Switch Layer 3	Wire Speed
QoS	L2-L4
MPLS	L2-L4
PoE	N/A
Packet Buffer	128 MB
Ports	12x1000BaseTX
Switch Fabric (internal)	40Gbit/s
Flash	64 MB
SDRAM	256 MB
MAC address table	512k
L3 hosts (IPv4)	32k
L3 hosts (IPv6)	16k
L3 Routes (IPv4)	240k
L3 Routes (IPv6)	240k
L2 Multicast groups	1k
L3 Multicast groups (IPv4)	4k
L3 Multicast groups (IPv6)	1k
Filters	4k
Meters	4k
Counters	4k

#### IEEE

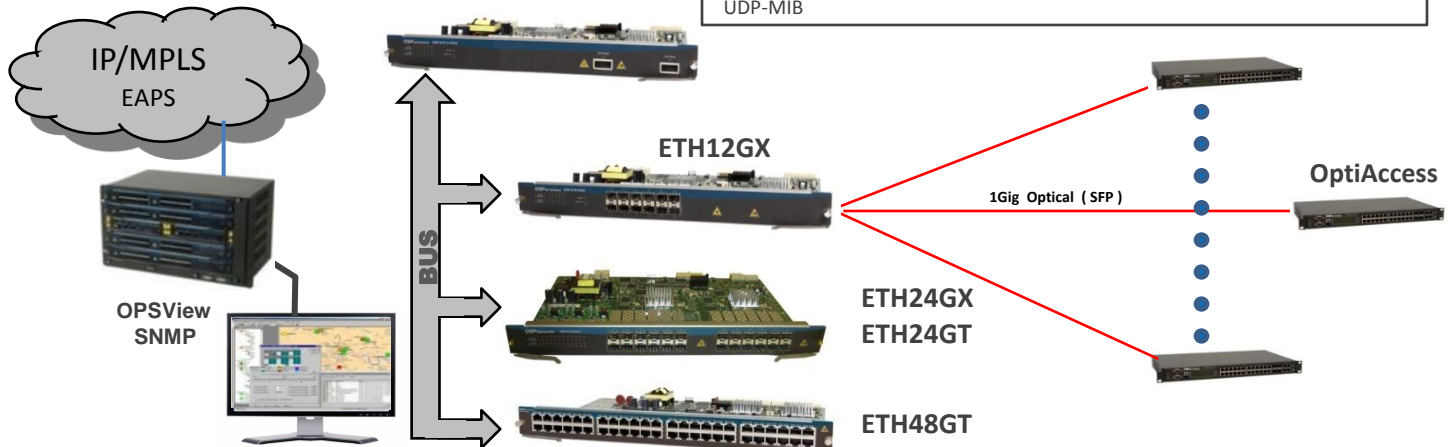
802.3/802.3u/802.3z	10Base-T, 100Base-TX, 1000Base-SX
802.3ab	1000Base-T
802.3x	Flow Control
802.3ac	Extension for VLAN Tagging
802.1D	Bridging
802.1Q	Virtual LAN
802.1w	Rapid Spanning Tree
802.1s	Multiple Spanning Tree
802.3ad	Link Aggregation
802.1p	Priority Support
802.1x	Port Security
802.3ah	Ethernet First Mile
802.1AB	LLDP
802.1v	MAC-based IP-Subnet, Protocol based

#### IETF

RFC1812	IPv4
RFC1157	SNMP Protocol
RFC2819/2021/1757	RMON I e RMON II
RFC2865/2138/2058	RADIUS Authentication/Authorization
RFC2030	Simple Network Time Protocol (SNTP) v4
RFC3619	EAPsv1
RFC3164	Syslog Protocol
RFC1058/1723	RIP/RIPv2
RFC1583/2178	OSPFv2
RFC1112/2236/3376	IGMPv1/IGMPv2/IGMPv3
RFC2474/2475	DiffService

#### MIBs

Bridge MIB	RFC1493
Entity MIB	RFC2037
Interface MIB	RFC1229/1573/2233/2863
MIB-II	RFC1213
ETHERLIKE-MIB	RFC1398/1623/1643/2665
Extended Bridge MIB	RFC2674 (Q-Bridge-MIB, P-Bridge-MIB)
RMON-MIB	RFC1757
RS-232-MIB	
SNMPv2-MIB	
SNMPv2-SMI	
SNMPv2-TC	
TCP-MIB	
UDP-MIB	





# Opti-X 2x10GX

## Dual Port 10Gbp/s ( SFP ) MPLS Layer2/3 Module

MPLS	VPWS - L2 VPN over MPLS ( Draft Martini )
	LER / LSR Support
	Label Distribution Protocol ( LDP )
	Mapping between 802.1p and EXP Field of MPLS
	BGP/VPN - L3 VPN over MPLS ( RFC 2547/4364 )
	VPLS – Virtual LAN Services
	Resource Reservation Protocol-Traffic Engineering ( RSVP-TE )
Management	Command Line Interface (CLI) via SSH, Telnet and Console
	Web Server with SSLv3
	SNMP v1/v2c/v3
	RMON grupos 1, 2, 3 and 9
	Configuration of ACLs with multiple comparisons and actions
	Network diagnosing tools for ( telnet, traceroute and Ping)
	Cabling diagnostics tools
	Up to 2 firmwares flash, with upgrade via TFTP or HTTP/HTTPS
	4 Flash settings with upload and download via TFTP or HTTP / HTTPS
	Link OAM (EFM – IEEE 802.3ah)
	Link Layer Discovery Protocol (LLDP – IEEE 802.1AB)
	Static or dynamic IP address (DHCP / BOOTP)
	DHCP relay with option 82
	SNMP filters for controlling access to Web, Telnet and SSH
	Security
MAC addresses configuration limit per port and VLAN	
Local and Remote Syslog	
Authentication, authorization and accounting with RADIUS & TACACS +	
E-mail notification (SMTP)	
Mechanisms for protecting against attacks from Denial of Service (DoS)	
SNTP	
VLAN	Tagging for up to 4096 simultaneous VIDs (IEEE 802.1Q)
	MAC-based, IP-Subnet based, Protocol-based (IEEE 802.1v)
	Q-in-Q double tagging
	Private VLAN
	Dynamic VLAN (GVRP)
Link Aggregation	32 logical groups, with up to 8 ports in each active group
	Static or dynamic way settings LACP (IEEE 802.3ad)
	Configuration criterion for load balancing .

Auto-negotiation	Speed, duplex mode, flow control and MDI/MDIX
Flow Control	Backpressure in half duplex; PAUSE (IEEE 802.3x) in full duplex
Protection	Classic Spanning Tree (IEEE 802.1D)
	Rapid Spanning Tree (IEEE 802.1w)
	Per-VLAN Rapid Spanning Tree
	Multiple Spanning Tree (IEEE 802.1s)
	BPDU Guard, EAPsv1, Link flap detection, Loopback detection
QoS (marking, classification and prioritization)	8 queues per port
	TCI tagging (IEEE 802.1p)
	IP Precedence/TOS or DSCP/TOS
	Source/Destination IP or MAC
	TCP ports ou UDP ports
	Generic L2-L7 filter match
	Rate Shapping (Ingress and Egress), communications granularity of 64 Kbit/s per port and flow via definition of CIR and PIR
	Weighted Round Robin, Weighted Fair Queuing, Strict priority or combination of these techniques and algorithms for scheduling queues
	Dual WRED configurations, one for in-profile and one for out-of-profile
Additional Layer 2 Functionality	Maximum rate of Broadcast, Multicast and DLF controlled by port
	Head of Line Blocking protection
	Up to 9Kb Jumbo Frame support
	IGMP (v1/v2/v3). Snooping Query functionality may be used
	Ageing global Layer 2 or by VLAN
	Layer 2 Protocol Tunneling
Additional Layer 3 Functionality	Traffic Monitor per port and / or flow of packets
	Static Routing
	RIP v1/v2, OSPF v2 and BGP v4
	Redundancy via VRRP
	PIM (SM, DM and SD)
Proxy ARP	



OptiCore 400 Chassis

### Order Information

OptiCore 800 Chassis	OptiCore-800-Chassis
OptiCore 400 Chassis	OptiCore-400-Chassis
OptiEdge 100 Chassis with Power Supply	OptiEdge-100 Chassis
Dual-port 10Gbp's Optical ( XFP ) module	2x10GX
Quad -port 10Gig's Optical ( XFP ) module	4x10GX
12-port GigE ( SFP ) optical module	12GX
12-port GigE ( SFP ) + 10Gbp's ( XFP ) module	1x10+12GX
24-port GigE ( SFP ) + Dual 10Gbp's ( XFP ) module	2x10+24GX
24-port GigE ( SFP ) optical module	24GX
24-port GigE ( RJ45 ) electrical module	24GT
48-port GigE ( RJ45 ) electrical module	48GT
48-port GigE ( SFP ) optical module	48GX
Enhanced HQoS Module	HQoS-M