



DmSwitch 2100 EDD – Series

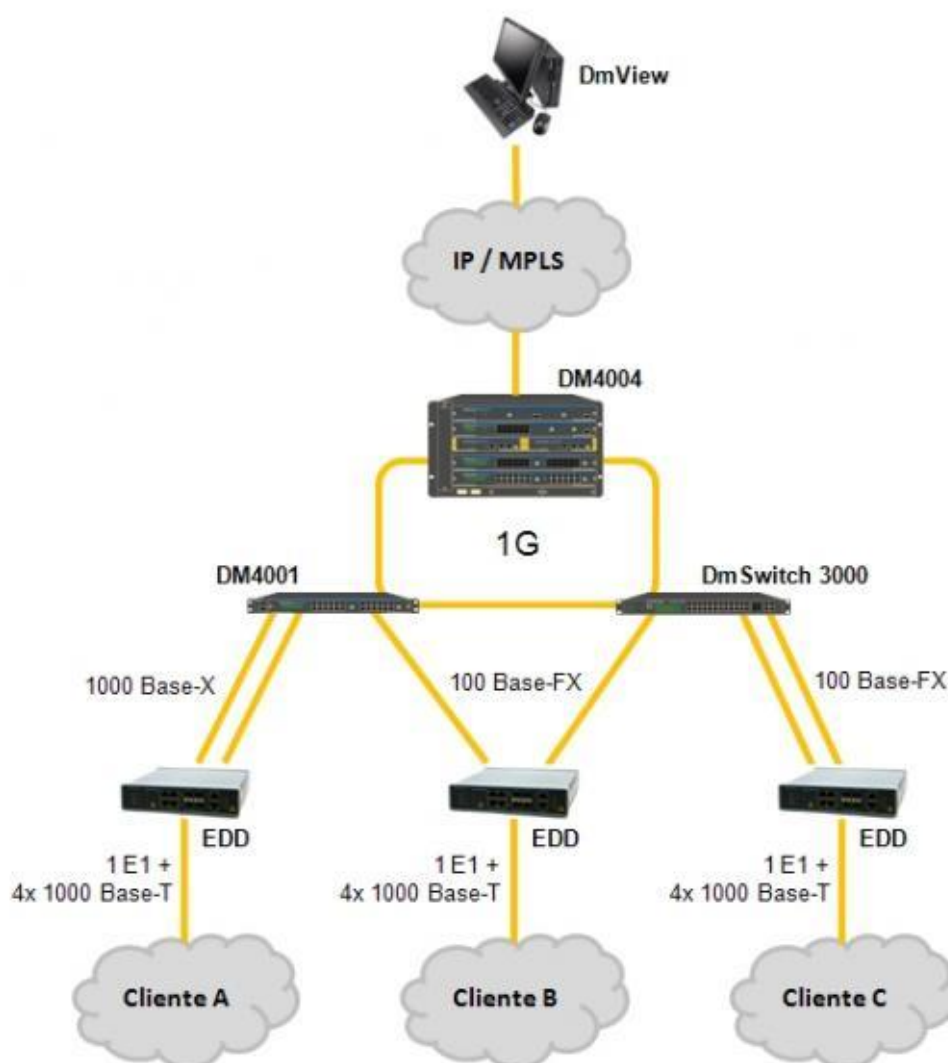
DmSwitch 2100 Metro Ethernet Series

DmSwitch 2100 – EDD (Ethernet Demarcation Device) product line is the family of DATACOM switches designed to offer LAN/WAN intelligent demarcation services at the last mile of Metro Ethernet access networks. With the EDD product line it is possible to monitor and control the service in the entire network.

The EDD performs wire speed switching of level 2 packets, and it may operate both with point-to-point topologies (with 1+1 type protection) or in a ring topology by using Ethernet protection protocols such as xSTP or EAPS.

Along with switches from the DM3000, DM4100 and DM4000 families it is possible to determine a new optical network topology to access the last mile.

The architecture can be defined as ETTX (Ethernet To The Premises). This way it is possible to provide TDM legacy services by using circuit emulation with *Pseudowires*, apart from native Ethernet services with advanced network demarcation devices.



Main Features

Wire Speed L2

L2 packet switching is made on silicon with 24Gbit/s fabric switch with more than 17Mpps forwarding rate with 64 bytes packets.

VLANs

Virtual LANs may be built on DmSwitch Switches EDD using all of the 4,094 VLANs defined in IEEE 802.1q standard simultaneously, also offering double tagging (Q-in-Q) and enabling the creation of TLS services.

Security

Our DmSwitch EDD line has mechanisms that guarantee secure operation, administration and maintenance (OAM) of the installed devices.

Through remote Syslog, single clock via SNTP, and protection against DoS (Denial of Service), it is possible to build a reliable management structure. It also supports the feature SNTP Server.

AAA mechanisms are available with delivery assurance via RADIUS and TACACS+. These services allow the Authentication for all user types (admin/normal), Authorization and Accounting.

For Metro Ethernet applications, the number of MAC addresses available may be limited per port, and bandwidth may be limited for broadcast, multicast and destination lookup failure DLF (Destination Lookup Failure) traffic.

Protection Mechanism

Spanning Tree protocols are available, including RSTP (Rapid Spanning Tree), which has shorter conversion times, MSTP (Multiple Spanning Tree) for better resource allocation and greater scalability. Are also available the EAPS (Ethernet Automatic Protection Switching) and ERPS (Ethernet Ring Protection Switching) protocols, which are specific for sub-50ms protections in Ethernet rings. It enables the design of Metro Ethernet application topologies with protection and short failure recovery times.

Management Facilities

DATAKOM DmSwitch EDD provides a centralized management is available through DATAKOM management tool DmView, which works on either Windows or Solaris platforms, and with full redundancy, and is compatible with the FCAPS model. The device has a CLI (Command Line Interface) with automatic assistance in the syntax of commands and parameters, and is accessible via Telnet, and RS-232 Console.

Agent SNMPv1, v2c and v3 are also available.

When DmSwitch 2100 is connected to the other DM3000, DM4000, and DM4100 line switches, it is possible to use the remote management IP-less functionality (OAM IP-less). In this mode the DmSwitch EDD is managed by DmView via the switch to which it is connected.

In order to simplify the DmSwitch EDD management, it is possible to store up to 2 different configurations in the DmSwitch EDD, choosing which one of them should be used when starting up the unit.

This device allows monitoring the use of CPU memory through CLI and SNMP.

Also, cabling infrastructure and network diagnostic tools are available, including Digital Diagnostic (SFF-4872).

Advanced QoS Facilities

DmSwitch 2100 has four queues per port, with prioritization algorithms that allows a wide range of definitions, such as: definition of priority for certain data flows, weight configuration for each queue and minimum flow rate definition in all device physical ports.

Rating can be done by using standard IEEE 802.1p, or the Precedence IP or DSCP fields. In addition, QoS statistics are made available, thus allowing improved network control.

The bandwidth control has granularity of 64Kbit/s in the PIR (Peak Information Rate) determination, and it may be applied to the port input and output traffic.

See below some of the options of supported filters:

- Match: 802.1p, all, destination-ip, destination-mac, destination-port, dscp, ethertype, protocol, source-ip, source-mac, source-port, tos-bits, tos-precedence, vlan, etc.
- Action: Permit, deny, 802.1p, 802.1p-from-tos, counter, drop-precedence, dscp, egress-block, int-802.1p, pkt-802.1p, pkt-802.1p-from-tos, tos, tos-from-802.1p, etc.

These filters are very flexible, which allows the packets that exceed the bandwidth specification to be evaluated/marked. Among the actions allowed one has the permit, deny, and remarking of many packet fields.

OAM Ethernet

Point-to-Point OAM (EFM) according to IEEE 802.3ah is also supported. This enables fault indications, including Dying Gasp, Unidirectional Link and Critical Event. EFM operates with a configurable interval between PDUs, for interoperability with other vendors.

The DmSwitch 2100 line supports End-to-End OAM (CFM) according to IEEE 802.3ag and ITU-T Y.1731 standards. This enables proactively monitoring of the connectivity (Continuity Check) and isolating faults through Loopback Messages (ping L2) and Linktrace Messages (traceroute L2). Two-way Frame Delay and Frame Delay Variation Bidirectional measurements enable performance monitoring functions.

Pseudowire TDM⁽¹⁾

Designed to meet the convergence applications of services developed for the new packet network, DmSwitch enables the use of pseudowire (PWE3) technology for the emulation of attributes essential to the TDM service.

The electrical E1 interfaces present in the device are emulated in the Ethernet network by using pseudowires. E1 interfaces support both framed mode and unframed mode, thus allowing the transport of "bit transparent" data.

Power Supply

Internal source with automatic selection (90 to 250V_{AC} 50/60Hz or 36 to 72V_{DC})

Available Models⁽²⁾

DmSwitch 2104G2 – EDD (SERIES II)

Device from the DmSwitch 2100 EDD (Ethernet Demarcation Device) family with plastic cabinet It has advanced functionalities for the Metro L2 networks, such as VLAN, QoS, EAPS, xSTP, OAM, among others.

It has the following external interfaces:

- 4 LAN ports 10/100/1000Base-TX (RJ45 Cat5, Cat5e and Cat6)
- 2 WAN optical ports 1000Base-X - SFP
- 2 WAN optical ports 100Base-FX/1000Base-X - SFP
- 1 CONSOLE port for management via serial RS232
- 1 MGMT port 10/100Base-TX (RJ45) for management
- 1 POWER AC/DC input with automatic selection

DmSwitch 2104G2 – EDD 2E1 (SERIES II)

Device from the DmSwitch 2100 EDD (Ethernet Demarcation Device) family with plastic cabinet It has advanced functionalities for the Metro L2 networks, such as VLAN, QoS, EAPS, xSTP, OAM, among others. It has electrical E1 interfaces, which allows the emulation of circuits by using TDM Pseudowires.

It has the following external interfaces:

- 4 LAN ports 10/100/1000Base-TX (RJ45 Cat5, Cat5e and Cat6)
- 2 WAN optical ports 1000Base-X - SFP
- 2 WAN optical ports 100Base-FX/1000Base-X - SFP
- 2 E1 ports (RJ45), 75 or 120 ohms (eight bundles for configuration, four in each port)
- 1 CLOCK SOURCE port, output – BITS (Building Integrated Timing Supply)
- 1 CONSOLE port for management via serial RS232
- 1 ALARM port for input and output of external alarms (optional)
- 1 POWER AC/DC input with automatic selection

DmSwitch 2104G2 – EDD 8E1 (SERIES II)

It has advanced functionalities for the Metro L2 networks, such as VLAN, QoS, EAPS, xSTP, OAM, among others. It has E1 interfaces, which allows the emulation of circuits by using TDM Pseudowires.

It has the following external interfaces:

- 4 LAN ports 10/100/1000Base-TX (RJ45 Cat5, Cat5e and Cat6)
- 2 WAN optical ports 1000Base-X - SFP
- 2 WAN optical ports 100Base-FX/1000Base-X - SFP
- 8 E1 ports (RJ45), 75 or 120 ohms (eight bundles for configuration, one in each port)

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- 1 CLOCK SOURCE port, output – BITS (Building Integrated Timing Supply)
- 1 CONSOLE port for management via serial RS232
- 1 ALARM port for input and output of external alarms (optional)
- 1 POWER AC/DC input with automatic selection

DmSwitch 2106 – 4GX

Device from the DmSwitch 2100 EDD (Ethernet Demarcation Device) family with plastic cabinet. It has advanced functionalities for the Metro L2 networks, such as VLAN, QoS, EAPS, xSTP, OAM, among others.

It has the following external interfaces:

- 6 LAN ports 10/100/1000Base-TX (RJ45 Cat5, Cat5e and Cat6)
- 2 WAN optical ports 1000Base-X - SFP
- 2 WAN optical ports 100Base-FX/1000Base-X - SFP
- 1 CONSOLE port for management via serial RS232
- 1 ALARM port for input and output of external alarms (optional)
- 1 POWER AC/DC input with automatic selection

DmSwitch 2106 – 4GX+2E1

Device from the DmSwitch 2100 EDD (Ethernet Demarcation Device) family with plastic cabinet. It has advanced functionalities for the Metro L2 networks, such as VLAN, QoS, EAPS, xSTP, OAM, among others. It has E1 interfaces, which allows the emulation of circuits by using TDM Pseudowires.

It has the following external interfaces:

- 6 LAN ports 10/100/1000Base-TX (RJ45 Cat5, Cat5e and Cat6)
- 2 WAN optical ports 1000Base-X - SFP
- 2 WAN optical ports 100Base-FX/1000Base-X - SFP
- 2 E1 ports (RJ45) with impedance of 75 or 120 ohms (eight bundles for configuration, four in each port)
- 1 CLOCK SOURCE port, input and output – BITS
- 1 CONSOLE port for management via serial RS232
- 1 ALARM port for input and output of external alarms (optional)
- 1 POWER AC/DC input with automatic selection

DmSwitch 2106 – 4GX+8E1

Device from the DmSwitch 2100 EDD (Ethernet Demarcation Device) family with plastic cabinet. It has advanced functionalities for the Metro L2 networks, such as VLAN, QoS, EAPS, xSTP, OAM, among others. It has E1 interfaces, which allows the emulation of circuits by using TDM Pseudowires.

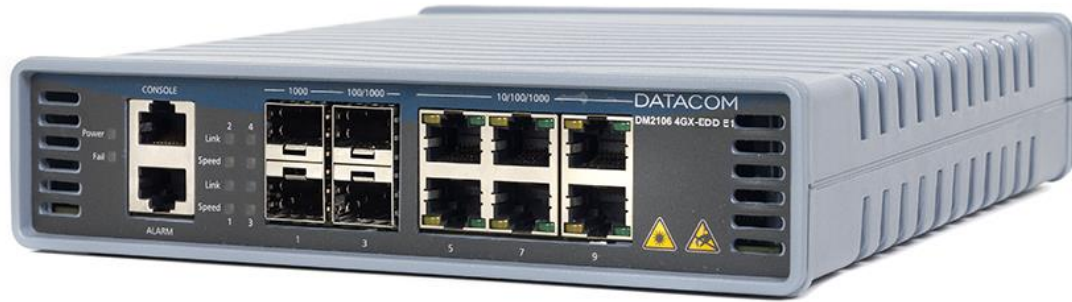
It has the following external interfaces:

- 6 LAN ports 10/100/1000Base-TX (RJ45 Cat5, Cat5e and Cat6)
- 2 WAN optical ports 1000Base-X - SFP
- 2 WAN optical ports 100Base-FX/1000Base-X - SFP
- 8 E1 ports (RJ45) with impedance of 75 or 120 ohms (eight bundles for configuration, one in each port)
- 1 CLOCK SOURCE port, input and output – BITS
- 1 CONSOLE port for management via serial RS232
- 1 ALARM port for input and output of external alarms (optional)
- 1 POWER AC/DC input with automatic selection

Cabinet Models

DATAKOM line standard Plastic Table Cabinet. It is 195-mm wide, 200-mm deep, and 44-mm high (with rubber feet).

This cabinet is intended to be used on benches or with a 19-inch rack with a suitable tray MA-01 (800.0141.xx).



DmSwitch 2100 Hardware

DmSwitch EDD Model	DmSwitch 2105 G2 EDD (SERIESII)	DmSwitch 2104 G2 EDD 2E1 (SERIES II)	DmSwitch 2104 G2 EDD 8E1 (SERIES II)
L2 Switch	Wire Speed	Wire Speed	Wire Speed
QoS	4 queues (L2-L3)	4 queues (L2-L3)	4 queues (L2-L3)
Electrical Ports 10/100/1000 Base-TX	4	4	4
Optical Ports 1000 Base-X	2	2	2
Optical Ports 100Base-FX/1000 Base-X	2	2	2
MAC Address Table	8k	8k	8k
PWE3 ⁽¹⁾	N.A.	2E1 (RJ45)	8E1 (RJ45)
Optical Protection	External	External	External
Power Source (AC/DC)	Interna AC/DC automatic selection	Interna AC/DC automatic selection	Interna AC/DC automatic selection
Relative Humidity	10 a 90% non-condensing	10 a 90% non-condensing	10 a 90% non-condensing
Operation Temperature	0 a 55 °C	0 a 55 °C	0 a 55 °C
Physical Structure	Plastic Cabinet for Tables	Plastic Cabinet for Tables	Plastic Cabinet for Tables

DmSwitch 2100 Hardware

DmSwitch EDD Model	DmSwitch 2106 4GX	DmSwitch 2106 4GX 2E1	DmSwitch 2106 4GX 8E1
L2 Switch	Wire Speed	Wire Speed	Wire Speed
QoS	4 queues (L2-L3)	4 queues (L2-L3)	4 queues (L2-L3)
Electrical Ports 10/100/1000 Base-TX	6	6	6
Optical Ports 1000 Base-X	2	2	2
Optical Ports 100Base- FX/1000 Base-X	2	2	2
MAC Address Table	8k	8k	8k
PWE3 ⁽¹⁾	N.A.	2E1 (RJ45)	8E1 (RJ45)
Optical Protection	External	External	External
Power Source (AC/DC)	Interna AC/DC automatic selection	Interna AC/DC automatic selection	Interna AC/DC automatic selection
Relative Humidity	10 a 90% non- condensing	10 a 90% non- condensing	10 a 90% non- condensing
Operation Temperature	0 a 55 °C	0 a 55 °C	0 a 55 °C
Physical Structure	Plastic Cabinet for Tables	Plastic Cabinet for Tables	Plastic Cabinet for Tables

DmSwitch 2100 Software

Features	Details
Flow Control	Backpressure in half duplex; PAUSE (IEEE 802.3x) in full duplex
Auto-negotiation	Speed, duplex mode, flow control and MDI/MDIX
Management	Command Line Interface (CLI) via Telnet, SSHv2 and Console
	Telnet and SSHv2 (Client and Server) - inband and outband management
	Management via DmView Graphic Interface
	Remote Management through DM3000 or DM4000 or DM4100 switch
	SNMP v1/v2c/v3
	RMON groups 1, 2, 3, and 9
	Network diagnostic tools (traceroute, ping)
	Firmware upgrade in flash via TFTP or DmView
	Access levels to manage user groups
	Up to 2 configurations in flash, with upload or download via TFTP
	Access via SNMP to QoS Contactors
	Ethernet OAM (EFM – IEEE 802.3ah, CFM – IEEE 802.1ag and ITU-T Y.1731)
	Ethernet Local Management Interface (E-LMI defined by MEF16)
Link Layer Discovery Protocol (LLDP – IEEE 802.1ab)	
Security	MAC address limit configurable per port
	Remote Syslog
	Support to Syslog Server
	Authentication, Authorization and Accounting (AAA) with TACACS+ .
	Authentication and Accounting with RADIUS .
	Storm Control unicast / multicast / broadcast
	Protection mechanisms against Denial of Service (DoS)
	SNTP Client/Server
VLAN	Tagging with up to 4096 simultaneous VIDs (IEEE 802.1q)
	Port Based

Features	Details
	Q-in-Q double tagging
	Vlan Translate with up to 16 translations.
Protection	Classic Spanning Tree (IEEE 802.1d)
	Rapid Spanning Tree (IEEE 802.1w)
	Multiple Spanning Tree (IEEE 802.1s)
	Loopback Detection
	EAPS (RFC3619)
	ERPSv1 (ITU-T G.8032)
	Backup Link
QoS (Marking Rating and Prioritization)	4 queues per port
	TCI tagging (IEEE 802.1p)
	IP Precedence/TOS or DSCP/TOS
	Rating by MAC
	Filter with generic match
	Rate-Limit (Ingress and Egress), with granularity of up to 64 Kbit/s per port and per flow in the definition of CIR and PIR enabling Traffic Shaping and Policing .
	WRR, WFQ, RR and SP with queue scheduling algorithms
Link Aggregation	Static or dynamic configuration via LACP (IEEE 802.3ad)
PWE3 ⁽¹⁾	TDM Circuit Emulation via SaToP (RFC4553)
	Circuit Emulation via CESoPSN (RFC5086)
	Clock source configuration
L2 Functionality	Maximum Broadcast, Multicast and DLF rate controlled by port
	Support to Jumbo Frame up to 9KB
	Ageing L2 configurable
	Tunneling of L2 protocols
	Link Failure Propagation (LFP)
	Traffic Monitor for ports

Features	Details
Other Functionalities	Debugging controls to help in the operation
	Telnet enabling and configurable HTTP
	Counters (packets received, transmitted, discarded) for all interfaces

Main Standards Complied

For the complete list, contact DATACOM Thecnical Support.

IEEE

802.1ab	Link Layer Discovery Protocol (LLDP)
802.1ad	Provider Bridges
802.1ag	Connectivity Fault Management (CFM)
802.1d	Media Access Control (MAC) Bridge
802.1p	Priority Support
802.1q	Virtual LAN
802.1q-in-q	VLAN Stacking
802.1s	Multiple Spanning Tree (MSTP)
802.1w	Rapid Spanning Tree
802.3	10 BASE T
802.3ab	1000 BASE T
802.3ad	Link Aggregation (LAG)
802.3ah	Ethernet First Mile (EFM)
802.3u	100 BASE TX
802.3x	Flow Control
802.3z	1000 BASE SX/LX

ITU-T

Y.1731	OAM functions and mechanisms for Ethernet based networks
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IETF

RFC854	Telnet Protocol Specification
RFC1492	An Access Control Protocol, Sometimes Called TACACS
RFC2030	Simple Network Time Protocol (SNTP) V4
RFC2058	RADIUS Authentication and Authorization
RFC2138	Remote Authentication Dial In User Service (RADIUS)

RFC2139	RADIUS Accounting
RFC2865	Remote Authentication Dial In User Server (RADIUS)
RFC3164	The BSD Syslog Protocol
RFC3619	Ethernet Automatic Protection Switching (EAPS) version 1
RFC4250	The Secure Shell (SSH) Protocol Assigned Numbers
RFC4251	The Secure Shell (SSH) Protocol Architecture
RFC4252	The Secure Shell (SSH) Authentication Protocol
RFC4253	The Secure Shell (SSH) Transport Layer Protocol
RFC4254	The Secure Shell (SSH) Connection Protocol

QoS

RFC2309	Queue Management and Congestion Avoidance in the Internet
RFC2474	Definition of the differentiated services field (DS) in Ipv4
RFC2475	An architecture for differentiated services
RFC2597	Assured Forwarding PHB Group
RFC2598	An Expedited Forwarding PHB
RFC2697	A single rate three color marker
RFC3140	Per hop behavior identification codes
RFC3246	An expedited forwarding PHB

MIB and SNMP

RFC1157	Simple Network Management Protocol (SNMP)
RFC1212	Concise MIB Definitions
RFC1213	MIB for Network Management of TCP/IP-based internets:MIB-II
RFC1215	A Convention for Defining Traps for use with the SNMP
RFC1229	Extensions to the generic-interface MIB
RFC1441	SNMPv2 Protocol Framework

RFC1643	Definitions of Managed Objects for the Ethernet-like InterfaceTypes
RFC1650	Definitions of Managed Obj for the Ethernet-like IF Types using SMIV2
RFC1757	Remote Network Monitoring Management Information Base
RFC1901	Introduction to Community-based SNMPv2
RFC1902	Structure of Management Information for Version 2 of SNMPv2
RFC1903	Textual Conventions for Version 2 of SNMPv2
RFC1904	Conformance Statements for Version 2 of SNMPv2
RFC1905	Protocol Operations for Version 2 of SNMPv2
RFC1907	Management Information Base (MIB) for SNMPv2
RFC1908	Coexistence between V1 and V2 of the Internet-standard NMF
RFC2570	Introduction to V3 of the Internet-standard NMF
RFC2576	Coexistence between SNMP v1, v2, v3
 <i>TDM⁽¹⁾</i>	
RFC4553	Structure-Agnostic TDM over Packet (SAToP)
RFC5086	Structure-Aware TDM Circuit Emulation Service over Packet Switched Network (CESoPSN)

Accessories & Attachments⁽²⁾

- SFP-100BaseSX: MM, 850nm, 2-km reach, LC connector
- SFP-100BaseLX: SM, 1310nm, 30-km reach, LC connector
- SFP-100BaseLX+: SM, 1310nm, 40-km reach, LC connector
- SFP-100BaseBX20-U: SM, 1310nm TX / 1550nm RX, 20-km reach, LC connector
- SFP-100BaseBX20-D: SM, 1550nm TX / 1310nm RX, 20-km reach, LC connector
- SFP-100BaseBX60-U: SM, 1310nm TX / 1550nm RX, 60-km reach, LC connector
- SFP-100BaseBX60-D: SM, 1550nm TX / 1310nm RX, 60-km reach, LC connector
- SFP-100BaseLH: SM, 1550nm, 80-km to 100-km reach, LC connector
- SFP-100BaseLZ: SM, 1550nm, 80-km to 120-km reach, LC connector
- SFP-1000BaseSX: MM, 850nm, 550-m reach, LC connector
- SFP-1000BaseLX: SM, 1310nm, 10-km reach, LC connector
- SFP-1000BaseLX+: SM, 1310nm, 30-km reach, LC connector
- SFP-1000BaseBX20-U: SM, 1310nm TX / 1490nm RX, 20-km reach, LC connector
- SFP-1000BaseBX20-D: SM, 1490nm TX / 1310nm RX, 20-km reach, LC connector
- SFP-1000BaseBX60-U: SM, 1310nm TX / 1490nm RX, 60-km reach, LC connector
- SFP-1000BaseBX60-D: SM, 1490nm TX / 1310nm RX, 60-km reach, LC connector
- SFP-1000BaseLH: SM, 1550nm, 80-km reach, LC connector
- SFP-1000BaseLZ: SM, 1550nm, 80-km to 120-km reach, LC connector
- SFP-1000BaseLZ: SM, 1550nm, 120-km to 150-km reach, LC connector
- MA-16 – Adaptador Gabinete-Bastidor 19 polegadas EDD 8E1
- MA-17 – Adaptador Gabinete-Bastidor 19 polegadas EDD 2E1

Note: All accessories above should be purchased separately.

⁽¹⁾ Functionality present in E1 interface models only.

⁽²⁾ All SFP modules mentioned at this datasheet must be purchased separately.