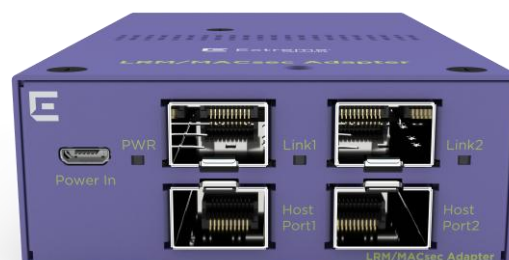


LRM/MACsec Adapter

Highlights

- Adds 10Gb Long Reach Multimode (LRM) support to an Extreme switching SFP+ switch port
- Optional 128- or 256-bit MACsec link encryption via software license
- Supports up to two ports of LRM and/ or MACsec encryption per Adapter
- Simultaneous LRM and MACsec on each SFP+ port
- Fan-less device
- Direct attach SFP+ host cables supplied with Adapter
- Optional rack-mount bracket that holds up to 5 LRM/ MACsec Adapters in 1RU



The LRM/MACsec Adapter is a two-port external adapter that can be used in conjunction with an Extreme switch to add 10 Gigabit Long Reach Multimode (LRM) and/or MACsec link encryption to the switch. It effectively enables either LRM or MACsec support on SFP/SFP+ switch ports that do not otherwise support these capabilities.

The Adapter is equipped with four physical SFP+ ports: two for direct connection to the host switch and two for external link connection. Two host cables are also included with each Adapter for connection to the host switch. Fully managed from the host switch, the Adapter does not require any setup via local console cable or Ethernet port.

The Adapter provides the necessary hardware to drive up to two LRM external links when connected to the host switch's 10Gb SFP+ ports. The Adapter can simultaneously support MACsec encryption* across the same LRM links. MACsec-only operation is also possible on host switch ports when LRM is not required.

An optional multi-unit rack-mount kit is available that holds up to five LRM/MACsec Adapters in a single RU.

*A separate license must be applied on the host switch for MACsec encryption.

MACsec

The Adapter supports the IEEE 802.1AE standard for MACsec, including 128-bit and 256-bit Advanced Encryption Standard (AES) for secure link encryption. By encrypting traffic from the host switch through the Adapter, it ensures secure communications for all Ethernet traffic across the external link. MACsec functionality can be provided to either 1Gb SFP or 10Gb SFP+ ports on the host switch.

Power

The Adapter can receive power from the host switch via host cables included with the Adapter. Depending on configuration, the Adapter may require auxiliary power. A USB (micro-B) cable is included with the Adapter for instances when auxiliary power is needed. Refer to the [ExtremeSwitching Hardware Installation Guide](#) for details.

LRM/MACsec Adapter Supported Platforms

The LRM/MACsec Adapter is fully managed and configured from the host switch and is supported on the following Extreme switching platforms:

- X440-G2 Series
- X450-G2 Series
- X460-G2 Series
- X590 Series
- X620 Series
- X670-G2 Series
- X690 Series
- X695 Series
- 5320 Series
- 5520-VIM-4XE Module
- 5720 Series

Notes:

1. ExtremeXOS version 30.1 or later must be installed on the host ExtremeXOS switches. X590 is supported with ExtremeXOS version 30.2 or later. See the [LRM/MACsec Adapter Hardware Installation Guide](#) for the latest information on supported switches/ports in the "Maximum Number of LRM/MACsec Adapters, by Switch Model and Connection Type" table.
2. For the 5320 Series switch, the LRM/MACsec Adapter is supported starting with Switch Engine version 32.3. See the [5320 Series Installation Guide](#) for the latest information on supported switches/ports in the "Maximum Number of LRM/MACsec Adapters, by Switch Model and Connection Type" table.
3. For the 5720 Series switch, the LRM/MACsec Adapter is supported starting with Switch Engine version 32.3 or starting with Fabric Engine version 8.9. See the [5720 Series Installation Guide](#) for the latest information on supported switches/ports in the "Maximum Number of LRM/MACsec Adapters, by Switch Model and Connection Type" table.

Physical Specifications

Item	Description
Ports	• 2 x 1Gb/10Gb SFP+ (to connect to the external network) • 2 x 1Gb/10Gb SFP+ (to connect to the host switch; host cables included)
Dimensions	• 2.99 in W x 4.87 in L x 1.18 in H (76 cm x 123.5 cm x 30 cm)
Weight	• 17.2 oz (488 g)

Operating Specifications

- Operating Temperature: 0°C to 45°C (32°F to 113°F)
- Storage Temp: -40°C to 70°C (-40°F to 158°F)
- Humidity: 10% to 95% relative humidity, non-condensing

Environmental Specifications

- EN/ETSI 300 019-2-1 v2.1.2 – Class 1.2 Storage
- EN/ETSI 300 019-2-2 v2.1.2 – Class 2.3 Transportation
- EN/ETSI 300 019-2-3 v2.1.2 – Class 3.1e Operational
- EN/ETSI 300 753 (1997-10) – Acoustic Noise
- ASTM D3580 Random Vibration Unpackaged 1.5G

Environmental Compliance

- EU RoHS 2011/65/EU
- EU WEEE 2012/19/EU
- China RoHS SJ/T 11363-2006
- Taiwan RoHS CNS 15663 (2013.7)

Regulatory and Safety

North American ITE

- UL 60950-1 (U.S.)
- UL 62368-1
- CSA 22.2 No. 60950-1 (Canada)
- Complies with FCC 21CFR 1040.10 (U.S. Laser Safety)
- CDRH Letter of Approval (US FDA Approval)

European ITE

- EN 60950-1
- EN 60825-1
- EN 62368-1
- IEC 60825-1 Class 1 (Lasers Safety)

International ITE

- CB Report & Certificate per IEC 60950-1
- AS/ NZS 60950-1 (Australia / New Zealand)
- IEC 62368-1

EMI/EMC Standards

North American EMC for ITE

- FCC CFR 47 part 15 Class A (USA)
- ICES–O 3 Class A (Canada)

European EMC Standards

- EN 55032 Class A
- EN 55024
- EN 300 386 v1.6.1 (EMC Telecommunications)
- 2014/30/EU EMC Directive

International EMC Certifications

- CISPR 32, Class A (International Emissions)
- AS/NZS CISPR32
- CISPR 24 Class A (International Immunity)
- IEC 61000–4–2 / EN 61000–4–2 Electrostatic Discharge, 8kV Contact, 15 kV Air, Criteria B
- IEC 61000–4–3 Radiated Immunity 10V/m, Criteria A

IEEE 802.3 Media Access Standards

- IEEE 802.3ae 10GBASE–X

Ordering Information

Part Number	Product Name	Description
10965	LRM/MACsec Adapter	LRM/MACsec Adapter with two unpopulated SFP+ network ports, includes two host cables with integrated SFP/SFP+ transceivers for host switch connection, and USB cable for optional power connection. License required to enable MACsec.
10966	5–Unit Rack Mount Bracket	Optional rack mount bracket for LRM/MACsec Adapter. Holds five units in 1RU.

MACsec Feature Licenses

Part Number	Product Name	Description
16778	X440–G2 MACsec Feature Pack	X440–G2 EXOS MACsec Feature Pack. Enables MACsec for use with LRM/MACsec Adapter.
16779	X450–G2 MACsec Feature Pack	X450–G2 EXOS MACsec Feature Pack. Enables MACsec for use with LRM/MACsec Adapter.
16780	X460–G2 MACsec Feature Pack	X460–G2 EXOS MACsec Feature Pack. Enables MACsec for use with LRM/MACsec Adapter.
17435	X620 MACsec Feature Pack	X620 EXOS MACsec Feature Pack. Enables MACsec for use with LRM/MACsec Adapter.
17137	X670–G2 MACsec Feature Pack	X670–G2 EXOS MACsec Feature Pack. Enables MACsec for use with LRM/MACsec Adapter.
17138	X690 MACsec Feature Pack	X690 EXOS MACsec Feature Pack. Enables MACsec for use with LRM/MACsec Adapter.
17139	X590 MACsec Feature Pack	X590 EXOS MACsec Feature Pack. Enables MACsec for use with LRM/MACsec Adapter.
EXOS–MACSEC–FP–X695	X695 MACsec Feature Pack	X695 EXOS MACsec Feature Pack. Enables MACsec for use with LRM/MACsec Adapter.

10Gb Long Reach Multimode (LRM) Transceivers

Part Number	Product Name	Description
10303	LRM SFP+ Module	10GBASE–LRM SFP+, 1310nm, LC, 220m MMF
10GB–LRM–SFPP	10GBASE–LRM SFP+ 220M MM Optic	10GBASE–LRM SFP+ 220M MM Optic

10Gb Transceivers Supported for MACsec-only Operation

Part Number	Product Name	Description
10301	SR SFP+ module	10GBASE-SR SFP+, 850nm, LC, 300m OM3 MMF, 400m OM4 MMF
10302	LR SFP+ module	10GBASE-LR SFP+, 1310nm, LC, 10 km SMF
10309	10GBASE-ER SFP+	10GBASE-ER SFP+, 1550nm, LC connector, transmission length of up to 40 km on SMF
10310	10GBASE-ZR SFP+	10Gb, 10GBASE-ZR, SMF, 1550 nm, up to 80 km, LC SFP+
10325	10Gb SFP+ DWDM Tunable	10Gb DWDM Tunable, 80 km SMF, LC SFP+
10GB-BX10-U	10 GB, SINGLE FIBER SM, -U 10 KM	10Gb, Single Fiber SM, Bidirectional, 1270 nm Tx / 1330nm Rx, 10 km, Simplex LC SFP+ (must be paired with 10GB-BX10 -D)
10GB-BX10-D	10 GB, SINGLE FIBER SM, -D 10 KM	10Gb, Single Fiber SM, Bidirectional, 1330 nm Tx / 1270 nm Rx, 10 km, Simplex LC SFP+ (must be paired with 10GB-BX10 -U)
10GB-BX40-U	10 GB, SINGLE FIBER SM, -U 40 KM	10Gb, Single Fiber SM, Bidirectional, 1330nm Tx / 1330nm Rx, 40 km, Simplex LC SFP+ (must be paired with 10GB-BX40 -D)
10GB-BX40-D	10 GB, SINGLE FIBER SM, -D 40 KM	10Gb, Single Fiber SM, Bidirectional, 1270nm Tx / 1270nm Rx, 40 km, Simplex LC SFP+ (must be paired with 10GB-BX40 -U)
10GB-F10-SFPP	10 GB, ACTIVE OPTICAL DAC, 10 M	10Gb, Active optical direct attach cable with 2 integrated SFP+ transceivers, 10m
10GB-F20-SFPP	10 GB, ACTIVE OPTICAL DAC, 20 M	10Gb, Active optical direct attach cable with 2 integrated SFP+ transceivers, 20m
10304	10GBASE-CR SFP+ 1m	10GBASE-CR SFP+ pre-terminated twin-ax copper cable with link lengths of 1m
10305	10GBASE-CR SFP+ 3m	10GBASE-CR SFP+ pre-terminated twin-ax copper cable with link lengths of 3m
10306	10GBASE-CR SFP+ 5m	10GBASE-CR SFP+ pre-terminated twin-ax copper cable with link lengths of 5m
10307	10GBASE-CR SFP+ 10m	10GBASE-CR SFP+ pre-terminated twin-ax copper cable with link lengths of 10m

1Gb Transceivers Supported for MACsec-only Operation

Part Number	Product Name	Description
10051H	1000BASE-SX SFP, Hi	1000BASE-SX SFP, MMF 220 & 550 meters, LC connector, Industrial Temp
10052H	1000BASE-LX SFP, Hi	1000BASE-LX SFP, MMF 220 & 550 meters, SMF 10 km, LC connector, Industrial Temp
10053H	1000BASE-ZX SFP, Hi	1000BASE-ZX SFP, SMF 70 km, LC connector, Industrial Temp
10056H	1000BASE-BX-D BiDi SFP, Hi	1000BASE-BX-D SFP SMF single fiber, 1490nm Tx/ 1310nm Rx wavelength, 10Km simplex LC Industrial Temp
10057H	1000BASE-BX-U BiDi SFP, Hi	1000BASE-BX-u SFP SMF single fiber, 1310nm Tx/ 1490nm Rx wavelength, 10Km simplex LC Industrial Temp
MGBIC-BX40-U	1000BASE-BX-U BiDi SFP 40Km	1000BASE-BX-U SFP, single fiber, 1310nm Tx/ 1490nm Rx wavelength, 40 km Industrial Temp
MGBIC-BX40-D	1000BASE-BX-D BiDi SFP 40Km	1000BASE-BX-D SFP, single fiber, 1490nm Tx/ 1310nm Rx wavelength, 40 km Industrial Temp
MGBIC-BX120-U	1000BASE-BX-U BiDi SFP 120Km	1000BASE-BX-U SFP, single fiber, 1490nm Tx/ 1590nm Rx wavelength, 120 km Industrial Temp
MGBIC-BX120-D	1000BASE-BX-D BiDi SFP 120Km	1000BASE-BX-D SFP, single fiber, 1590nm Tx/ 1490-nm Rx wavelength, 120 km Industrial Temp
I-MGBIC-LC03	1000BASE-LX MMF SFP	1000BASE-LX SFP MMF, 1310nm, 2 km with 62.5 micron OM1MMF, 1 km on 50 micron OM2 MMF, LC

Warranty

The adapter is covered by the warranty for the switch it is connected to. For warranty details, visit our [Policies and Warranties page](#).

