10-Gigabit Ethernet Interface Modules for the X-Pedition™ and Matrix™ Platforms

- Standards-based support for 10GBASE-XX Ethernet
- Hot swappable; plugs into a 10-Gigabit Ethernet XENPAK port of X-Pedition core routers and Matrix switches
- Provides flexible, automatic recognition of interface for connectivity to single-mode fiber or multimode fiber networks

Data Sheet

- **Standards based, supports 10GBASE-XX Ethernet**
  - — Uniform form factor, size, connector type and electric pin outs ensure compatibility
- **Hot-swappable input/output device**
  - — Plugs into a 10-Gigabit Ethernet XENPAK port on X-Pedition core routers and Matrix switches
  - — Provides flexible, automatic recognition of interface for connectivity to single-mode fiber or multimode fiber networks
- **Increases return on investment**
  - — Supports a modular approach to network connectivity, ensuring you pay only for what they require

When designing network infrastructures using the capabilities of 10-Gigabit Ethernet, it is important to carefully consider the cabling type (e.g., single-mode or multimode fiber) and the performance at a specified wavelength. The performance is characterized by channel insertion loss (cabling attenuation) and modal bandwidth (for multimode fiber).

Providing a wide variety of 10-Gigabit Ethernet connectivity options, the 10GBASE XENPAK interface modules for the X-Pedition and Matrix are suitable for use across a range of applications, including the data center and extending out to the enterprise wiring closet. These high-performance interface modules provide the fastest connectivity available to any other IEEE 802.3ae standards-compliant device.

All 10-Gigabit Ethernet interfaces are based upon the XENPAK Multi-source Agreement (MSA). This MSA defines a fiber-optic transceiver module, which conforms to the IEEE 802.3ae 10-Gigabit Ethernet (10 GbE) standard and includes all physical media dependent (PMD) types defined by the IEEE for 802.3ae 10 GbE.

Interface Modules Available

10GBASE-SR—850 Nanometer serial port for 10-Gigabit Ethernet over multimode fiber (MMF) via an SC connector. Supports link lengths ranging from 26 meters to 300 meters depending on grade of fiber installation.

10GBASE-LR—1310 Nanometer serial port for 10-Gigabit Ethernet over single-mode fiber (SMF) via an SC connector. Supports 10-Gigabit Ethernet transmission over distances between 2 Km and 10 Km.

10GBASE-ER—1550 Nanometer serial port for 10-Gigabit Ethernet over single-mode fiber (SMF) via an SC connector. Supports "long-haul" 10-Gigabit Ethernet transmission over distances between 2 Km and 40 Km.

10GBASE-LX4—4 channel WWDM-based transceiver operating within the 1310nm range for distances up to 300 meters (MMF) or 10 Km (SMF) via and SC connector. Supports "long-haul" 10-Gigabit Ethernet transmission over distances between 2 Km and 40 Km. The use of a mode-conditioning patch cord on multimode fiber to achieve its specified range of operating distances is required.

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Specifications

Cabling Specifications

XENPAK	Wavelength (nm)	Fiber Type	Core Size (micron)	Modal Bandwidth (MHz/km)	Cable Distance
10GBASE-LR	1310	SMF	8.3/9/10	N/A	2 km–10 km
10GBASE-ER	1550	SMF	8.3/9/10	N/A	40 km
10GBASE-SR	850	MMF	62.5	160	26 m
			62.5	200	33 m
			50	400	66 m
			50	500	82 m
			50	2000	300 m
10GBASE-LX4	1300	MMF	62.5	500	300 m
			50	400	240 m
			50	500	300 m
		SMF	10	N/A	10 km

Per the IEEE 802.ae specification, the minimum cabling distance for all models is 2 m.
The ER optics require 5db of attenuation if run on cable of less than 10 km.

Cabling Specifications

XENPAK	Transmit Power (dBm)		Receive Power (dBm)		Transmit and Receive Wavelength (nm)
	Max	Min	Max	Min	
10GBASE-LR	.5	-3.6	.5	-14.4	1290 to 1330
10GBASE-ER	4.0		-1.0		1530 to 1565
10GBASE-SR		-4.3	-7.1		840 to 860
10GBASE-LX4	-.05 per lane		-.05 per lane		Four lanes with overall range: 1269 to 1356

Specifications

Technical Specifications

Completely integrated Ethernet PHYs
True hot-swappable capabilities
Built-in XAUI backplane transceivers

Physical Specifications

Dimensions

2.24 cm (.88") H x 11.52 cm (4.53")
D x 6.13 cm (2.41") W (from the front)

2.24 cm (.88") H x 11.52 cm (4.53")
D x 3.60 cm (1.42") W (from the rear)

Environmental Specifications

Operating Temperature

10GBASE-LR: 0° C to 55° C (32° F to 131° F)
10GBASE-ER: 0° C to 70° C (32° F to 158° F)
10GBASE-SR: 0° C to 70° C (32° F to 158° F)
10GBASE-LX4: 0° C to 70° C (32° F to 158° F)

Storage Temperature

10GBASE-LR: -40° C to 80° C (-40° F to 176° F)
10GBASE-ER: -40° C to 85° C (-40° F to 185° F)
10GBASE-SR: -55° C to 125° C (-67° F to 257° F)
10GBASE-LX4: -40° C to 85° C (-40° F to 185° F)

Agency and Standards Specifications

Safety

UL 60950, CSA 60950, EN 60950, EN 60825 and IEC 60950

Electromagnetic Compatibility

47 CFR Parts 2 and 15, CSA C108.8, EN 555022, EN 55024, EN 61000-3-2, EN 61000-3-3, AS/NZS CISPR 22, and VCCI V-3

Ordering Information

10GBASE-SR

850 Nanometer serial port for 10-Gigabit Ethernet over multimode fiber (MMF) via an SC connector

10GBASE-LR

1310 Nanometer serial port for 10-Gigabit Ethernet over single-mode fiber (SMF) via an SC connector

10GBASE-ER

1550 Nanometer serial port for 10-Gigabit Ethernet over single-mode fiber (SMF) via an SC connector

10GBASE-LX4

4 channel WWDM-based transceiver operating within the 1310 nm range for distances up to 300 meters (MMF) or 10 Km (SMF) via an SC connector

Warranty

As a customer-centric company, Enterasys is committed to providing the best possible workmanship and design in our product set. In the event that one of our products fails due to a defect in one of these factors, we have developed a comprehensive warranty that protects you and provides a simple way to get your products repaired as soon as possible.

Service and Support

Enterasys understands that superior service and support is a critical component of ***Networks that Know***.™ The Enterasys **SupportNet Portfolio**—a suite of innovative and flexible service and support offerings—completes the Enterasys solution. SupportNet offers all the post-implementation support services you need—online, onsite or over the phone—to maintain your network availability and performance.

Additional Information

For additional information on the Matrix, visit **enterasys.com/products/switching**. For additional information on the X-Pedition, visit **enterasys.com/products/routing**

Contact Information

Contact Enterasys Sales at **877-801-7082** or **enterasys.com/corporate/contact/contact-sales.html**

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