

# ETHER-FLEX

## GIGABIT ETHERNET NETWORK INTERFACE MODULE

DATA SHEET



### FEATURES

- High-capacity with two Gigabit and eight Fast Ethernet ports in a single module
- Advanced routing support with an architecture designed to support IPv6 and emerging DOCSIS 3.0 network requirements
- Hardware-based packet filtering and forwarding supports high-performance routing
- Compatible with existing BSR 64000 NIMs to provide a cost-effective migration path for existing customers
- 10/100 Ethernet ports can be leveraged to bring content, cacheing, and application servers closer to subscribers
- Gigabit Ethernet ports provide high-speed connectivity from distribution hubs and regional headends to metro and core network infrastructure

Motorola's Ether-Flex™ Network Interface Module (NIM) provides the high-performance routing and availability cable operators depend on for the delivery of reliable tiered data and primary-line residential voice services. In addition, the Ether-Flex is designed to enable cost-effective network scalability to meet the ever-increasing bandwidth demand for ultra high-speed data and IPTV services.

The Ether-Flex module combines two-port Gigabit Ethernet and eight-port Fast Ethernet interfaces on a single module for the BSR 64000 CMTS/edge router to enable cable operators to deliver next generation bandwidth-hungry data, voice, and video IP-based services.

The BSR 64000 chassis can support up to four Ether-Flex modules, providing cable operators the flexibility and investment protection to gradually expand IP network capacity as they begin to migrate to all digital services leveraging high-speed channel bonding, enhanced routing, IPv6 addressing, and IP security features offered with the DOCSIS® 3.0 standard.

The Ether-Flex NIM is carefully architected with future network expansion in mind to satisfy the most demanding routing throughput and robust Quality of Service (QoS) routing protocols to allow cable operators to deploy feature-rich, real-time residential and commercial services. It is architected to support hardware accelerated multicast QoS traffic for IPTV services and up to 1,024 simultaneous BGP/MPLS VPNs for commercial services.



## High Performance

A unique, distributed forwarding architecture offers wire-speed packet forwarding regardless of route policies and QoS configuration. Ether-Flex provides hardware-based flow classification at wire-speed and delivers non-blocking performance for all cable voice, video, and data services.

## Advanced Routing

Policy-based routing is performed in hardware at wire-speed. Ether-Flex supports RIP V1/V2, OSPF V1/V2, BGP4, BGP/MPLS VPN, IGMPv3, PIMv2-SM and SSM, and DVMRP. It is architected to support IPv6 and emerging DOCSIS 3.0 requirements. The Ether-Flex NIM will support deployment of the BSR 64000 as a hardware-based, wire-speed MPLS Label Edge Router (LER) and Label Switch Router (LSR).

## Full Layer 3 Functionality

Ether-Flex supports a large number of Access Control Lists (ACLs) and offers multicast support on all ports. Wire-speed multicast support includes PIM and DVMRP (RFC1075) with support for many multicast group members. Ether-Flex supports simultaneous BGP/MPLS VPNs and thousands of Label Switched Paths (LSPs).

## High Capacity

Ether-Flex combines the functionality of two Gigabit Ethernet and eight 10/100 ports into a single card. Cable operators can benefit from higher capacity and full compatibility with deployed BSR 64000s.

## Flexible SFP Gigabit Ethernet Modules

Ether-Flex uses Small Form-Factor Pluggable (SFP) modules that support a variety of Gigabit Ethernet optical and copper interface types to provide flexible deployment options. SFP modules can be easily interchanged, and operators can easily replace or upgrade them as infrastructure requirements evolve. The SFP optical modules therefore can deliver substantial cost savings, both in maintenance and upgrade costs.

## Carrier-Class Redundancy

Full redundancy is available, including switchover based upon a link state change, a software issue, or a route change. Switchover can also be implemented based upon direction from a higher-level routing protocol. Ether-Flex provides carrier-class reliability for “five nines” uptime, and a mid-plane design allows for non-disruptive troubleshooting, reconfiguration, and repair. Multiple Ether-Flex modules can be installed for redundancy/loadsharing, and all modules are hot swappable.



## SPECIFICATIONS

### TECHNICAL SPECIFICATIONS

Ports	2-port Gigabit Ethernet (SFP module interface) or 8-port 10/100 Ethernet
Processor	Freescale MPC8260A PowerQUICC II Communications Processor @166MHz
Port Buffer Memory	512 MB SDRAM
Out-Of-Band Management	CLI via console port or Telnet
In-Band Management	SNMP V1/V3, Telnet, SSH

### PHYSICAL SPECIFICATIONS

Slot	One slot in the BSR 64000 chassis
Height	17.25 inches (43.8 cm)
Width	1 inch (2.54 cm)
Depth	15.5 inches (39.37 cm)
Weight (approximate, includes front and rear I/O modules)	8 lb (3.63 kg)

### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	32° to 104° F (0° to 40° C)
Non-Operating Temperature	-4° to 158° F (-20° to 70° C)
Operating Humidity	10 to 95% RH (non-condensing)
Non-Operating Humidity	5 to 95% RH (non-condensing)
Power	65 W (Typical)
Safety	UL60950-1:2003 1st Ed. EN 60950-1:2002, 1st Ed. IEC 60950-1:2001, 1st Ed. CSA C22.2 No. 60950-1-03 1st Ed.

Electromagnetic Emissions	CFR 47 Part 15, Subpart B, Class A ICES-003 Issue 4: 2003, Class A EN 300386 V 1.3.1: 2005, Telecom Centers AS/NZS CISPR 22: 2006 IEC CISPR 22: 2003 VCCI V3: 2005, Class A RRL Notice 2006-67
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Electromagnetic Immunity	EN 300386; EN 50083-2; EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4-5; EN 61000-4-6; KN 61000-4-2; KN 61000-4-3; KN 61000-4-4; KN 61000-4-5; KN 61000-4-6; RRL Notice 2005-130
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AVAILABLE OPTIONS				
Gigabit Ethernet SFP Modules	Cable Type	Wavelength	Cable Distance	Part Number
1000BASE-SX	Multimode Fiber	850 nm	500 M	533609-001-00
1000BASE-LX	Singlemode Fiber	1310 nm	10 KM	533609-002-00
1000BASE-EX	Singlemode Fiber	1310 nm	40 KM	533609-003-00
1000BASE-ZX	Singlemode Fiber	1550 nm	80 KM	533609-004-00
1000BASE-T	RJ-45 STP	N/A	100 M	533609-005-00

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