

Flexible Ethernet Access

The FLASHWAVE® 5150 product portfolio is specifically designed for fast and efficient rollout of Ethernet services within access networks. The portfolio features a variety of cost-optimized products that include a demarcation unit and a set of Ethernet aggregation devices that can be deployed within the access infrastructure to maximize your network resources.

The units are based on the IEEE 802.3ah Ethernet First Mile (EFM) standard and support the Operations, Administration and Maintenance (OAM) protocol as defined within the standard. The protocol has been extended to offer additional management capabilities and allow full management control of remote customer premises devices without the need for costly overlay management networks. As a standard feature, advanced Performance Monitoring (PM) capabilities allow operators to efficiently monitor and maintain Service Level Agreements (SLAs). Best of all, the FLASHWAVE 5150 family of products features a low cost of ownership, allowing for mass market deployment of Ethernet as a transport solution for access networks.

There are five units that make up the FLASHWAVE 5150 portfolio:

- FLASHWAVE 5150 CP customer premises demarcation unit
- FLASHWAVE 5150 ME 10/100Base-T Ethernet aggregation unit
- FLASHWAVE 5150 MO 100Base-X Ethernet aggregation unit
- FLASHWAVE 5150 MG Gigabit Ethernet aggregation unit
- FLASHWAVE 5150 CX media converter unit

Simplified Remote Management

All units in the FLASHWAVE 5150 portfolio support management via SNMP or EFM OAM for easy integration into existing management structures and systems. For ultimate flexibility, each unit can also remotely manage downstream FLASHWAVE 5150 units when a multilevel aggregation architecture is employed.

Flexible Customer Premises Demarcation

The FLASHWAVE 5150 CP customer premises demarcation unit utilizes Metro Ethernet Forum (MEF) compliant traffic control mechanisms to deliver either fixed rate or tunable bandwidth services. The rich feature set and compact design of this platform is well suited to deliver popular services such as Voice over IP (VoIP) or bandwidth on demand quickly and cost-effectively.

Cost-Effective Managed Ethernet Aggregation

The FLASHWAVE 5150 Ethernet aggregation units are ideal for mass market deployment of premium Internet access and Ethernet Line (E-Line) and Ethernet LAN (E-LAN) services as defined by the MEF. The units can be daisy-chained to provide aggregation ratios of up to 1000:1, dramatically lowering access costs and maximizing the efficiency of terminating switch/router ports. Each unit supports the IEEE 802.3ah EFM standard as well as advanced traffic management capabilities. Customer traffic is transparently transported using a combination of hardware assigned IEEE 802.1Q Virtual Local Area Network (VLAN) tags and Q in Q (or stacked) tagging.

The FLASHWAVE 5150 Ethernet aggregation units support Ethernet (up to 10 Mbps), Fast Ethernet (up to 100 Mbps) and Gigabit Ethernet (up to 1000 Mbps) data rates, allowing you to create diverse services such as E-Line, E-LAN or Virtual Private Networks (VPNs) from a basic set of building blocks. Unmatched flexibility with the FLASHWAVE 5150 Ethernet aggregation units allow flexible network deployment with simple service upgrades.

The FLASHWAVE 5150 ME aggregation unit supports up to ten 10/100Base-T electrical Ethernet access ports. Similarly, the FLASHWAVE 5150 MO aggregation unit supports up to ten 100Base-X optical Ethernet access ports via user-installable Small Form Factor Pluggable (SFP) modules. The FLASHWAVE 5150 MG aggregation unit raises the stakes with support for up to six Gigabit Ethernet access ports. All three aggregation units are based on the same aggregation, traffic management and forwarding technology, simplifying design and maintenance of Ethernet access networks.

Efficient Media Conversion

A FLASHWAVE 5150 CX media conversion unit is typically used as a service termination unit where physical interface separation is preferred over the virtual interface separation offered by the FLASHWAVE 5150 MO optical Ethernet aggregation unit or FLASHWAVE 5150 ME electrical Ethernet aggregation unit. This capability makes the FLASHWAVE 5150 CX media conversion unit a highly attractive solution for Central Office (CO) applications where multiple remote customers are consolidated onto a legacy transport network based on technology such as SONET/SDH.



- Flexible Deployment
- In-Band Management
- Ethernet Aggregation
- Rich Performance Monitoring

Features and Specifications

Architectures

- Point-to-point
- Ring
- Tree and branch
- Feeder to Ethernet networks

Protection

- Node and link protection via tandem node
- 1+1 network protection

Interface Types

FLASHWAVE 5150 CP

- 1 x 10/100/1000Base-T electrical access port
- 1 x 100/1000Base-X optical access port (SFP)
- 1+1 100/1000Base-X electrical or optical network port (SFP)

FLASHWAVE 5150 ME

- 10 x 10/100Base-T electrical access ports
- 1+1 100/1000Base-X electrical or optical network port (SFP)

FLASHWAVE 5150 MO

- 10 x 100Base-X optical access ports (SFP)
- 1+1 100/1000Base-X electrical or optical network port (SFP)

FLASHWAVE 5150 MG

- 6 x 1000Base-X optical access ports (SFP)
- 1+1 1000Base-X electrical or optical network port (SFP)

FLASHWAVE 5150 CX

- 10 x 10/100Base-T electrical access ports
- 10 x 100Base-X optical network ports (SFP)

Interface Specifications

- Dual fiber or bi-directional (single fiber working) SFP support
- Electrical (RJ-45) SFP for Gigabit Ethernet
- Auto negotiation according to IEEE 802.3
- Auto MDI/MDIX on copper interfaces
- Auto sensing of speed on non-SFP ports
- 1560 byte MTU for Fast Ethernet
- 9250 byte (jumbo frame) MTU for Gigabit Ethernet

QoS Parameters

- MEF traffic classification and management
- IEEE 802.1p (Class of Service) field classification
- Configurable IEEE 802.1Q tag addition and priority mapping
- Strict priority queuing and scheduling
- Eight priority queues with 16 MB of buffers allocated across priority queues (FLASHWAVE 5150 CP only)
- Three priority queues per port with 1 MB buffer per priority queue (FLASHWAVE 5150 MO, FLASHWAVE 5150 ME and FLASHWAVE 5150 MG only)
- Ingress policing and egress shaping of traffic

RFC and Regulatory Conformance

- RFC 1213 MIB (MIB II)
- RFC 1157 MIB (Generic V1 Traps)
- RFC 2863 MIB (Interfaces Group MIB)
- RFC 2737 MIB (Entity MIB v2)
- NEBS Level 3
- ETSI

Operations

- Ethernet First Mile (EFM) according to IEEE 802.3ah
- SNMP v1 agent and traps (with NEMI installed)
- NETSMART® 515 element manager
- Q in Q (stacked) tagging
- VLAN translation (mapping of TPID, priority bits and VLAN ID)
- SNMP to EFM OAM gateway capability for management (manage multiple downstream devices using a single IP address at the root node)
- Performance statistics (including frame & error counts)
- Optical power level monitoring for SFPs
- SSH or Telnet support
- RFC 2865 RADIUS authentication (client)
- Auto discovery according to IEEE 802.3ah
- Software/firmware download via HTTP or FTP (also includes Xmodem for FLASHWAVE 5150 CP)

Power Consumption (Heat Dissipation)

- | | |
|---------------------|-------------------|
| • FLASHWAVE 5150 CP | 50 W (170 BTU/hr) |
| • FLASHWAVE 5150 ME | 95 W (324 BTU/hr) |
| • FLASHWAVE 5150 MO | 95 W (324 BTU/hr) |
| • FLASHWAVE 5150 MG | 95 W (324 BTU/hr) |
| • FLASHWAVE 5150 CX | 95 W (324 BTU/hr) |

Operating Environment

- | | |
|---------------|---------------------------|
| • Temperature | 0 to 40° C (32 to 104° F) |
| • Humidity | 5 to 95% (non-condensing) |

Physical Characteristics

FLASHWAVE 5150 CP

- | | |
|--------------------------|---|
| • Dimensions (H x W x D) | 1.7 x 17.3 x 10.6"
(44 x 439 x 270 mm) |
| • Weight | 7.3 lb (3.3 kg) |
| • Power Input | -48 V DC or 110 V AC |

FLASHWAVE 5150 ME

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|--------------------------|---|
| • Dimensions (H x W x D) | 1.7 x 17.3 x 10.6"
(44 x 439 x 270 mm) |
| • Weight | 7.3 lb (3.3 kg) |
| • Power Input | -48 V DC or 110 V AC |

FLASHWAVE 5150 MO

- | | |
|--------------------------|---|
| • Dimensions (H x W x D) | 1.7 x 17.3 x 10.6"
(44 x 439 x 270 mm) |
| • Weight | 7.3 lb (3.3 kg) |
| • Power Input | -48 V DC or 110 V AC |

FLASHWAVE 5150 MG

- | | |
|--------------------------|---|
| • Dimensions (H x W x D) | 1.7 x 17.3 x 10.6"
(44 x 439 x 270 mm) |
| • Weight | 7.3 lb (3.3 kg) |
| • Power Input | -48 V DC or 110 V AC |

FLASHWAVE 5150 CX

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|--------------------------|---|
| • Dimensions (H x W x D) | 3.4 x 17.3 x 10.6"
(88 x 439 x 270 mm) |
| • Weight | 12.1 lb (5.5 kg) |
| • Power Input | -48 V DC or 110 V AC |

Contact your Fujitsu sales representative for more information on how to order this product.

Fujitsu Network Communications Inc.

2801 Telecom Parkway, Richardson, TX 75082

Tel: 800.777.FAST Fax: 972.479.6900

us.fujitsu.com/telecom



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