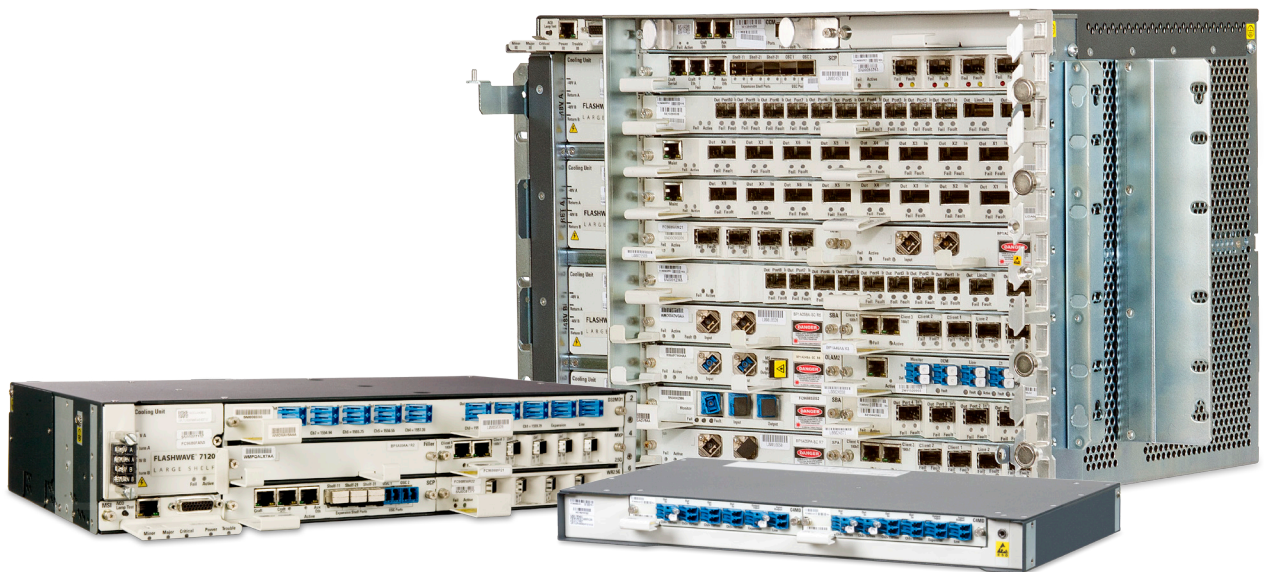# FLASHWAVE® 7120
# Micro Packet Optical Networking Platform



*The FLASHWAVE 7120 Micro Packet Optical Networking Platform (ONP) seamlessly combines Carrier Ethernet 2.0 capabilities with intelligent Wave Division Multiplexing (WDM), including FOADM and 2D and 4D ROADM, in a single platform. Its flexible design scales from a passive 1U CWDM FOADM for CPE access and fiber relief to best-of-breed packet optical metro and core functionality, including seamless interoperation and aggregation with the FLASHWAVE 5300 family of Ethernet services products.*

CE 2.0
MEF
CERTIFIED

# FLASHWAVE 7120
## Micro Packet Optical Networking Platform

## Smoothly Scale to Emerging Demand

Business customers are geographically dispersed, and they demand unpredictable mixes of voice, data, and video at competitive prices. Consequently, carriers must extend services while aggressively managing expenses, using infrastructure that smoothly scales to meet demands for greater bandwidth and cost-effective access for backhaul.

### Reduced Complexity, Extended Capabilities
The FLASHWAVE® 7120 platform simplifies bandwidth delivery, aggregation, and intelligent services to the network edge. This compact solution efficiently blends Carrier Ethernet 2.0 E-LINE and E-LAN data services with cost-effective FOADM and ROADM scaling, offering flexible transport capacity up to 400G (40 × 10G). The powerful FLASHWAVE 7120 platform provides intelligent network solutions for tier 2 and 3 network operators, enterprises, utilities, research and education, and healthcare companies. Key functionality includes:

- Convergence of WDM, Optical Transport Network (OTN), Carrier Ethernet, and SONET/SDH Packet Optical Networking Platform with 4D ROADM in a small footprint
- Cost-effective 10G data network scaling using the FOADM or ROADM
- Seamless Ethernet services access and aggregation for the FLASHWAVE 5300 product family
- Optical metro access and edge WDM networking
- MEF Carrier Ethernet (CE) 2.0 certification
- NETSMART® 1500 and NETSMART 1200 systems with point-and-click GUI for end-to-end management

The FLASHWAVE 7120 platform has a unique photonic layer solution that combines flexibility and cost-effectiveness with the reliability and management of traditional optical transport systems. Its comprehensive suite of passive and active modules permits flexible customization. As a result, you can reduce costs by mixing and matching components. That means you can reach more customers more economically.

### Options for Diverse Networks
The FLASHWAVE 7120 platform is available in three form factors: a 7RU aggregator hub, a 2RU compact aggregator, and a 1RU passive shelf. These chassis options enable application solutions ranging from Carrier Ethernet aggregation with 4D ROADM for optical hubbing to a compact WDM platform for fiber relief.

### Reach More Customers

| Applications | Technologies |
|---|---|
| • Access WDM | • TDM |
| • Wavelength service delivery | • WDM |
| • Optical extension and fiber relief | • FOADM/ROADM |
| • Multiservice backhaul | • OTN |
| • Business and enterprise services | • MEF Carrier Ethernet |

### Reduce Demand and Rationalize Your Infrastructure
The FLASHWAVE 7120 platform operates as a standalone WDM, Carrier Ethernet, or converged packet optical solution or as part of an integrated Fujitsu FLASHWAVE solution. Core-to-edge deployments are possible in concert with other Fujitsu platforms, and such applications can eliminate the need for back-to-back transponders and separate management systems.

Multiple integrated solutions are possible with these products:

- Packet ONPs, such as the FLASHWAVE 9500 platform
- ROADMs, such as the FLASHWAVE 7500 system, for core and transport applications
- Multiservice Provisioning Platforms (MSPPs), such as the FLASHWAVE 4500 and FLASHWAVE 4100 platforms, for certified optical networking
- Micro Packet ONPs, such as the FLASHWAVE 4100 ES and FLASHWAVE CDS systems, for integrated access and backhaul
- Carrier Ethernet access and aggregation devices, such as the FLASHWAVE 5300 family

### Manageable Flexibility
The FLASHWAVE 7120 architecture scales so that a single CPU under a single Target ID (TID) can manage service slots from multiple shelves. The NETSMART 1500 and NETSMART 1200 management systems allow the FLASHWAVE 7120 platform to be managed under the same Operations Support System (OSS) as other Fujitsu optical transport products. TL1 and Simple Network Management Protocol (SNMP) support integration into existing operating procedures and third-party management systems.

# Features and Specifications

| | |
|---|---|
| **Platforms** | FLASHWAVE 7120 shelf scaling options<br>• 1RU passive shelf with 2 interface slots<br>• 2RU managed system with 6 interface slots<br>  • Expandable to 4 shelves (24 interface slots)<br>   under a single TID<br>• 7RU shelf with 20 slots<br>  • Expandable to 3 shelves (60 slots) under a single TID<br>• 19", 23" and 500 mm ETSI rack mounts available |
| **Architectures** | • CWDM/DWDM<br>• Point-to-point<br>• Linear and ring<br>• 2D/4D ROADM |
| **Transponder Interfaces** | • Dual 2.5G multiprotocol transponders without<br>  performance monitoring<br>  • Rates: 125 Mbps to 2.7 Gbps<br>  • Protocols: 100FX, OC-3/STM-1, OC-12/STM-4,<br>   OC-48/STM-16, ESCON, 1G & 2G FC/FICON, 1 GbE<br>• Dual 2.5G multiprotocol transponders with<br>  performance monitoring<br>  • Rates: 125 Mbps to 2.7 Gbps<br>  • Protocols: OC-3, OC-12, OC-48, STM-16, 1 GbE<br>• Dual 10G multiprotocol OTN transponders<br>  • Rates: 9.9 to 11.1 Gbps<br>  • Protocols: OC-192/STM-64, 10 GbE WAN PHY,<br>   10 GbE LAN PHY, OTU2, OTU2e, 10G FC/FICON<br>  • Client (Y-cable) protection |
| **Muxponder Interfaces** | • 2-port, 2.5G (OTU1) muxponders<br>  • Client: 2 × 1 GbE<br>  • Network: 2.5G (OTU1)<br>• 10-port, 10G (OTU2) muxponders<br>  • Clients: 10 × 1 GbE; FC-1, 2, 4; OC-192 STM-16<br>  • Network: 10G (OTU2) |
| **Carrier Ethernet Interfaces** | • 12/2 Ethernet switch card<br>  • 12 × 1 GbE (10 × SFP, 2 × RJ-45)<br>  • 2 × 10 GbE (2 × XFP)<br>• 24/4 Ethernet switch card<br>  • 24 × 1 GbE (20 × SFP, 4 × RJ-45)<br>  • 4 × 10 GbE (4 × XFP)<br>• 8 × 10 GbE Ethernet switch card<br>  • 8 × 10 GbE (8 × XFP) |
| **Standards-based Design** | • 10 GbE G.709 digital wrappers (OTN)<br>• IEEE 802.1Q VLAN tagging<br>• IEEE 802.1ad provider bridges<br>• IEEE 802.3ad link aggregation<br>• Ring protection MSTP and G.8032 v2<br>• Y.1731 fault and performance measurement |
| **Ethernet Features** | • Simplified Layer 2 Ethernet through<br>  connectionless bridging<br>• 3-step service provisioning through embedded GUI<br>• Aggregation and switching<br>• Policing and shaping<br>• Rate limiting per port<br>• Bandwidth management per flow,<br>  including CIR/EIR/CBS/EBS<br>• Ethernet OAM&P, including Y.1731 and<br>  RMON 2819 performance monitoring<br>• Sub-50 millisecond guaranteed protection switching<br>  with G.8032 v2 and OTN |
| **Optical Components** | C-band optical amplifiers: Low-Gain, Mid-Gain, and Mid-Gain<br>with Mid-Stage Access |
| **Operations and Management** | • TL1 over OSI<br>• TL1 over TCP/IP (except native Ethernet interfaces)<br>• SNMP over UDP/IP (all interfaces)<br>• NETSMART 712 Craft GUI<br>• NETSMART 1500 and NETSMART 1200 management<br>  systems<br>• Telcordia OSMINE TIRKS and NMA<br>• Communications via out-of-band OSC or in-band OTN GCC |
| **Standards Compliance** | • NEBS Level 3 compliant<br>• RoHS compliant<br>• ANSI and ETSI compliant<br>• MEF CE 2.0–compliant for E-Line and E-LAN |

# Features and Specifications

| | | | |
|---|---|---|---|
| **Operating Environment** | Temperature | 0 to 50 °C | |
| | Humidity | 5 to 90% (noncondensing) | |
| | Power input | −48 V DC, redundant feeds | |
| **Physical Characteristics** | FLASHWAVE 7120 shelf (7RU) | Weight (fully loaded) | 80 lb (36 kg) |
| | | Dimensions (H × W × D) | 12.2 × 17.3 × 11.0" (311 × 440 × 279 mm) |
| | | Maximum power consumption | 920 W per shelf |
| | | Maximum heat dissipation | 3140 BTU/hour |
| | FLASHWAVE 7120 shelf (2RU) | Weight (fully loaded) | 28 lb (16.5 kg) |
| | | Dimensions (H × W × D) | 3.5 × 17.3 × 11.0" (90 × 440 × 279 mm) |
| | | Maximum power consumption | 275 W per shelf |
| | | Maximum heat dissipation | 938 BTU/hour |
| | FLASHWAVE 7120 passive shelf (1RU) | Weight (fully loaded) | 13 lb (5.9 kg) |
| | | Dimensions (H × W × D) | 1.73 × 17.3 × 11.0" (44 × 440 × 279 mm) |

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