

## FSP 150CC-T1804

### Carrier Ethernet service delivery over copper

Optical fiber deployment is growing. However, fiber does not yet reach all business locations, and it will be some time before it does. Service providers need a solution that enables them to provide intelligent and differentiated Carrier Ethernet services to locations served by copper-based local loops.

Our FSP 150CC-T1804 provides Carrier Ethernet 2.0 service extension over bonded T1 or E1 facilities for service providers who are looking to deploy an intelligent differentiated Ethernet service to locations with copper-based local loops. Supporting up to eight T1s or E1s, the product enables delivery of Carrier Ethernet 2.0 services up to 12Mbit/s or 16Mbit/s using the latest LCAS/VCAT bonding technology. With four Ethernet service ports and advanced service definition capabilities, our FSP 150CC-T1804 is capable of supporting multiple customers and multiple services over a shared network connection. What's more, its advanced demarcation technology enables service providers to offer an intelligent Carrier Ethernet 2.0 service demarcation point, compliant with the latest OAM standards.



### Your benefits

- ✓ **Ideal for large-scale deployment**  
Flexible and easy creation of SLA-compliant and MEF-certifiable Carrier Ethernet 2.0 services
- ✓ **Low touch provisioning**  
With an extensive set of remote OAM capabilities even unskilled craft personnel can install and turn up services without onsite provisioning
- ✓ **Advanced demarcation technology**  
For support of stringent SLAs and integration with a wide range of back-office support tools
- ✓ **VCAT/LCAS bonding**  
Up to eight T1/E1s to interoperate with legacy TDM infrastructure
- ✓ **End-to-end service assurance**  
Advanced demarcation technology for support of stringent SLAs and integration with a wide range of back-office support tools
- ✓ **Service intelligence**  
Sophisticated and MEF-certified UNI function provides the service intelligence necessary to offer a differentiated CE 2.0 portfolio

## High-level technical specifications

### Interfaces

- Access I/F: 2x 10/100BaseT ports and 2x 10/100/1000BaseT or 100/1000BaseX (SFP) ports
- Network I/F: 8x T1/E1 (RJ48) ports, VCAT/LCAS bonding technology

### Ethernet OAM

- Compliant with the latest OAM standards such as 802.3ah, 802.1ag, Y.1731
- Terminal and facility loopbacks
- Embedded RFC 2544 test generator and analyser

### VLAN support

- 4096 VLANs and stacked VLANs, 32 EVCs
- 2-tag mgmt. for c- and s-tag
- IEEE 802.1ad provider bridging
- Ethertype translation
- Jumbo frames up to 9612 bytes

### Performance monitoring

- RFC 2819 RMON Etherstats
- GR-820-CORE/ITU-T G.826 PDH performance statistics
- ITU-T Y.1731 single-and dual-ended frame loss measurement

### Traffic management

- Service classification based on IEEE 802.1p, 802.1Q and IP-TOS/DSCP
- VLAN tag priority mapping
- MEF-compliant policing (CIR/CBS/EIR/EBS)

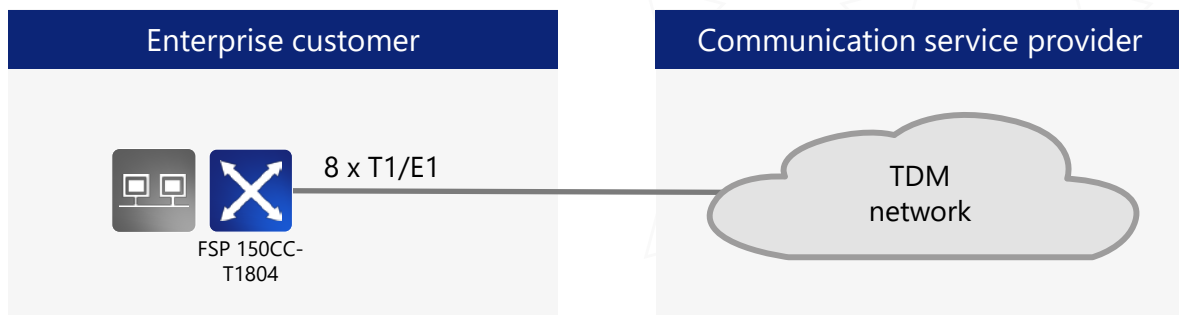
### Environmental

- 1RU compact chassis, ETSI compliant
- Integrated AC- or DC-PSU
- Operating temp.: -40 to +65°C (hardened environment)
- Max. power consumption: 20W

## Applications in your network

### Intelligent Carrier Ethernet 2.0 service demarcation over copper

- Differentiated CE2.0 service portfolio thanks to a sophisticated and MEF-certified UNI function
- Rate limiting, scheduling and shaping allow service providers to maintain QoS commitments and ensure fair bandwidth distribution, even when network resources are oversubscribed or congested.
- Extends the life of existing network infrastructure by adding Ethernet capability to existing add/drop multiplexers and microwave radios



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Optical Networking

**Access capacity**

- Two 10/100BaseT ports and two 10/100/1000BaseT or 100/1000BaseX (SFP) ports

**Network interface**

- Eight T1/E1 (RJ48) ports

**Network interface bonding**

- Virtual concatenation with link capacity adjustment scheme (VCAT/LCAS)

**VLAN support**

- 4096 VLANs (IEEE 802.1Q customer-tagged) and stacked VLANs (Q-in-Q service provider tagged)
- 2-tag management (push/pop/swap) for c-tag and s-tag
- IEEE 802.1ad provider bridging (c-tag, s-tag)
- Ethertype translation
- 32 Ethernet virtual circuits (EVC)
- 9612 byte per frame MTU transparency

**Traffic Management**

- Acceptable client frame policy: tagged or untagged
- Service classification based on IEEE 802.1p, 802.1Q and IP-TOS/DSCP
- VLAN tag priority mapping (IEEE 802.1ad PCP encoding)
- MEF-compliant policing (CIR/CBS/EIR/EBS) with three-color marking and eight classes of service
- Port shaping on transmit for both client and network ports

**Ethernet OAM**

- IEEE 802.3ah EFM-OAM link management
- IEEE 802.1ag connectivity fault management (CFM)
- ITU-T Y.1731 performance monitoring
- Terminal and facility loopbacks on port- and EVC-level for all interfaces
- Cable diagnostics with benchmarks (electrical interfaces only)
- Embedded RFC 2544 test generator and analyzer (ECPA)
- MEF-compliant Layer 2 control protocol disposition and extensive filter options for Layer 2 packet types
- Link loss forwarding to signal local link and network path failures
- Dying gasp message for power failure alarming (EFM-OAM and SNMP trap option)

**Performance monitoring**

- RFC 2819 RMON Etherstats on a per-port and per-service basis
- GR-820-CORE/ITU-T G.826 PDH performance statistics
- 15-minute and 1-day performance data bins
- ITU-T Y.1731 single- and dual-ended frame loss measurement

- Multi-CoS monitoring on EVCs scaling up to 128 simultaneous SOAM flows
- Threshold-setting and threshold-crossing alerts
- Physical parameter monitoring for SFP optics, including TCAs
- Temperature monitoring and thermal alarms

**Low touch provisioning**

- Text-based configuration files
- TFTP for configuration file copy

**Management and security****Local management**

- Serial connector (RJ45) using CLI
- Local LAN port (RJ45) using CLI, SNMP and Web GUI interfaces
- 3G/LTE USB interface

**Remote management**

- Maintains in-band VLAN and MAC-based management tunnels
- Fully interoperable with FSP 150CM, FSP 150EG-X and other FSP 150CC products

**Management protocols**

- IPv4 and IPv6 DCN protocol stacks, including dual-stackoperation and 6-over-4 tunnels
- Telnet, SSH (v1/v2), HTTP/HTTPS, SNMP (v1/v2c/v3)

**Secure administration**

- Configuration database backup and restore
- System software download via FTP, HTTPS, SFTP or SCP (dual flash banks)
- Remote authentication via RADIUS/TACACS
- SNMPv3 with authentication and encryption
- Access control list (ACL)

**IP routing**

- DHCP, RIPv2 and static routes, ARP cache access control

**System logging**

- Alarm log, audit log and security log

## Regulatory and standards compliance

- MEF CE 2.0 certified
- IEEE 802.1Q (VLAN), 802.1p (Priority), 802.1ag (CFM), 802.3ah (EFM), 802.1x
- ITU-T Y.1731, G.8010/Y.1306, G.8011.1+2, G.8012
- MEF-6.1, -9, -10.2, -11, -14, -20, -21, -22.1, -23.1, -25, -26.1, -30, -33
- IETF RFC 2544 (frame tests), RFC 2863 (IF-MIB),
- RFC 2865 (RADIUS), RFC 2819 (RMON)
- MEF-compliant ITU-T Y.1564 service activation testing
- ITU-T G.703/704, GR-499-CORE, ITU-T G.775, ANSI T1.107,
- ITU-T G.826, ANSI T1.231, GR-820-CORE, ITU-T G.832,
- ITU-T G.7042/7043, ITU-T G.7041/8040
- ANSI C84.1-1989
- ETSI 300 132-2, BTNR2511, ETS 300-019,
- ETS 300-019-2-[1,2,3], ETS 300-753
- NEBS Level 3 compliant
- Telcordia GR-499, GR-63-CORE, SR-332
- Safety IEC/UL/EN 60950, 21CFR1040.10, EN 60825, EN 50371,
- EN 300-386, EN 50160, IEC 60320/C14
- EMI EN 300-386, GR-1089-CORE, ETS 300-132, FCC Part 15, Class A, Industry Canada

## Environmental

- Dimensions: 1RU compact chassis, 220mm x 44mm x 240mm / 8.7" x 1.75" x 9.4" (W x H x D), ETSI-compliant
- Operating temperature: -40 to +65°C (hardened environment)
- Storage temperature: -40 to +70°C (GR-63-CORE)
- Humidity: 5 to 95%, B1 (non-condensing)
- Integrated PSU: 110/240 VAC or -48 to -72VDC with over-voltage and over-current protection
- Maximum power consumption: 20W