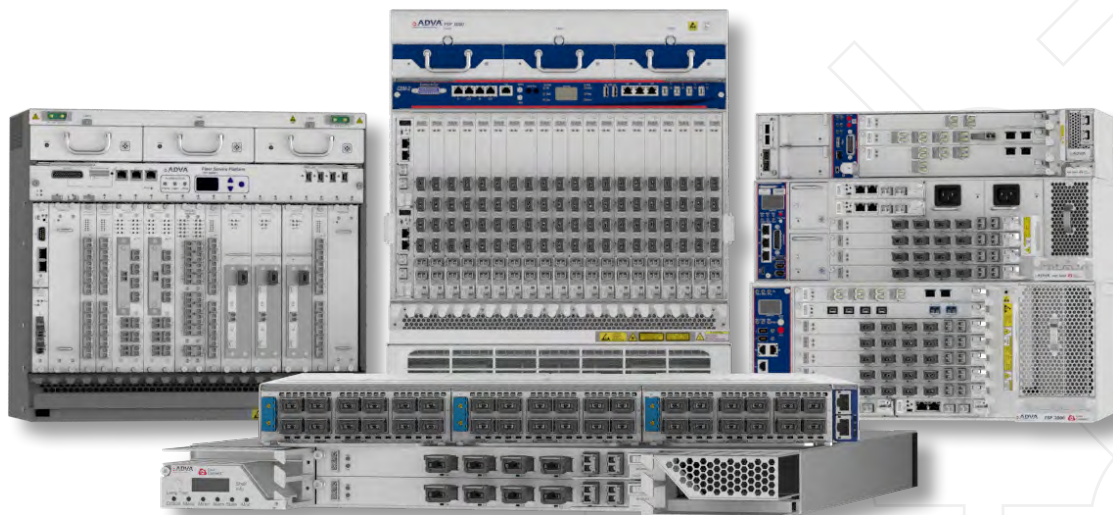


FSP 3000

Open and future-proof terascale optical transport

Today's optical transport demands are constantly changing. High-bandwidth services and cloud-based applications are booming and software-defined networking is evolving to the domain of transport networks. Network operators and enterprises need a flexible and scalable solution that increases agility and automation, while keeping cost and footprint at a minimum.

Our FSP 3000 is a scalable optical transport solution designed to efficiently deal with this new environment, lowering its complexity and minimizing cost-per-bit and operational efforts. With an open and modular design, our FSP 3000 supports a wide range of services and applications, from data center interconnect (DCI) to carrier-optimized infrastructure solutions. Incorporating the latest innovation in photonic networking and our innovative ConnectGuard™ low-latency encryption technology, FSP 3000 enables secure optical network solutions that can scale and accommodate tomorrow's needs. Moreover, with a high-density and energy-efficient design for smallest footprint and power consumption, our FSP 3000 meets the most stringent sustainability requirements.



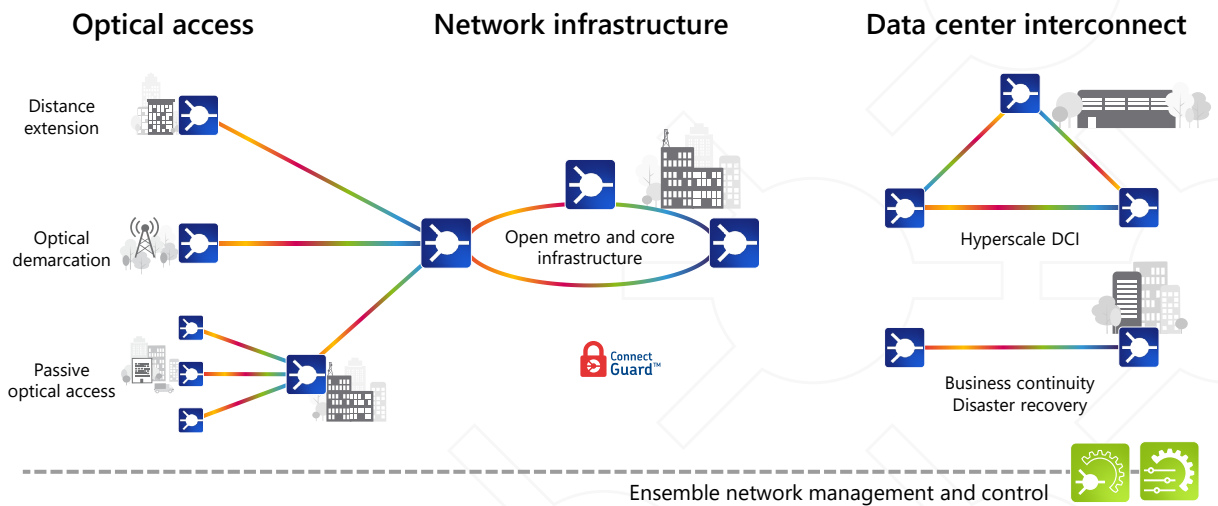
Your benefits

- ✓ **Scalability**
Ultra-high speed wavelengths with up to 800Gbit/s per single-port line interface; 38.4Tbit/s duplex capacity per fiber pair with best-in-class metrics; up to 3.6Tbit/s duplex capacity per 1RU chassis
- ✓ **Flexibility**
From complete turnkey systems including all equipment necessary for end-to-end transport applications to disaggregated solutions
- ✓ **Pay-as-you-grow design**
Modular and scalable architecture that ensures both low initial cost and flexibility into the future
- ✓ **Fully open and programmable**
Open line system (OLS) architecture and YANG-based APIs (OpenConfig) for network disaggregation and easy integration into SDN-based environments
- ✓ **Dynamic and scalable optical layer**
Multiple ROADM options from metro-optimized 2-degree ROADM to multi-degree ROADM for flexgrid optical layer
- ✓ **ConnectGuard™ encryption technology**
Certified Layer 1 data encryption, approved for German government ("VS-V") and NATO-restricted ("NATO confidential") data transport

High-level specifications

<h3>General information</h3> <ul style="list-style-type: none"> • Up to 38.4Tbit/s duplex capacity per fiber pair • Point-to-point, ring and mesh topologies with optional protection mechanisms • Open line system • Flexgrid support • Ensemble Controller and open APIs for mgmt. and control 	<h3>Services</h3> <ul style="list-style-type: none"> • Wide range of native service types: Ethernet, OTN, SONET/SDH, ESCON, Fibre Channel, FICON, Coupling Link, Infiniband, audio and video • Continuous data rate support from 100Mbit/s to 425Gbit/s 	<h3>Terminals</h3> <ul style="list-style-type: none"> • Fixed line (<=100Gbit/s) and SW-defined (>=100Gbit/s) transponders/muxponders • Up to 400Gbit/s per 1-slot card • Up to 1.2Tbit/s per channel • Up to 3.6Tbit/s per 1RU chassis • 400 / 1200Gbit/s OTN switches • 10Gbit/s QSFP-based service multiplexer (MicroMux™)
<h3>Photonic layer architectures</h3> <ul style="list-style-type: none"> • DWDM: up to 128 channels • CWDM up to 16 channels • Hybrid CWDM + DWDM • Wide variety of filters and ROADMs options up to 32 degree • Coherent and direct detection (PAM4) based solutions • Optimized OLS for 400G ZR DCI • OTC and OTDR (ALM) 	<h3>ConnectGuard™ encryption</h3> <ul style="list-style-type: none"> • Layer 1 AES-256 encryption with ultra low latency and 100% throughput • Dynamic key exchange <=4096 bit keys every minute • FIPS 140-2 and CC EAL-2 certified. BSI approved • Quantum-safe encryption via PQC or third-party QKD attach 	<h3>Power and environmental</h3> <ul style="list-style-type: none"> • Highest energy efficiency, TEER-proven Eco design • Redundant power supplies for -48VDC or 100-240VAC PSUs • Variety of active and passive chassis from 1RU to 12RU; 19in/ ETSI/NEBS rack mounting

Applications in your network



End-to-end network infrastructure

- Scalable system architecture for cost-effective access, metro and backbone optical network infrastructure
- Built-in access for optical timing channel (OTC) and OTDR (ALM)

DCI for cloud and business continuity applications

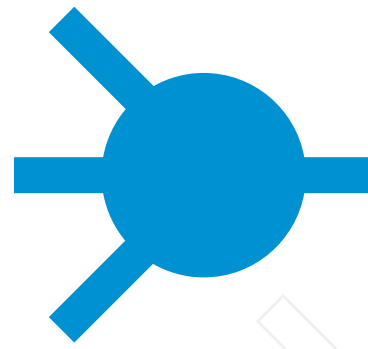
- Terascale data center connectivity
- Open hardware architecture and YANG-based software (OpenConfig) modelling for easy integration into SDN-based environments



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Product specifications are subject to change without notice or obligation.





FSP 3000 TeraFlex™

Ultra-compact terminal for hyperscale connectivity over any infrastructure

The phenomenal growth in data traffic combined with increasing cost pressures is creating an urgent need for more capacity and speed in data center interconnect (DCI) and carrier networks without significant increases in spend or hardware sprawl. ICPs, CNPs and CSPs need to rapidly scale their networks while retaining simplicity and meeting evolving density and power requirements. Our TeraFlex™ meets these exacting demands and takes scalability to a new level.

Our TeraFlex™ is a 1RU terminal that enables channels of up to 1.2Tbit/s and a total capacity of 7.2Tbit/s. Its ultra-compact footprint and open API design offer best-in-class density and interoperability. With its advanced capabilities, it takes flexibility to a whole new level. The FSP 3000 TeraFlex™ optimizes all optical paths over any distance, no matter which filter technology is used. It achieves this through fractional QAM modulation, which switches between lower and higher schemes for maximum spectral efficiency, significantly boosting capacity or extending the reach of installed legacy infrastructure without an OLS overhaul. TeraFlex™ is a scalable and flexible solution, supporting 100Gbit/s and 400Gbit/s services. What's more, 10GbE services are also supported via our pluggable MicroMux™ QSFP. This unique flexibility enables the smoothest service upgrade from 10GbE to 400GbE and gives service providers and data center operators the configuration flexibility to address a wide range of applications with minimum inventory sprawl and market-leading power efficiency. In addition, our TeraFlex™ delivers real-time streaming telemetry, a prerequisite for big-data-based network management.



Your benefits

- ✔ **Ultra-flexible modulation**
Boost capacity and reach over any network infrastructure with fractional QAM and continuous tunable baud rate
- ✔ **Open and modular design**
All system modules are externally accessible and field replaceable (non-service affecting)
- ✔ **Ultimate 100G and 400G client density**
36x 100GbE client ports, 9x 400GbE client ports or a mix of both served by a 1RU chassis
- ✔ **Terascale line interfaces**
Single-port 800Gbit/s line interfaces and channel data rates up to 1.2Tbit/s based on dual core DSP technology
- ✔ **Programmability through open APIs**
Direct integration into data center and SDN environments with open, YANG-based interfaces
- ✔ **From 10G to 400G services**
10Gbit/s support via our innovative MicroMux™ pluggable QSFP28

High-level technical specifications

General information

- 1RU chassis; 600mm rack and closed cabinet installation
- Up to 1.2Tbit/s per channel; 7.2Tbit/s total capacity
- Hot-swappable and field replaceable modules
- 3 slots for line cards

Client interface options

- 400GbE: DR4, FR4, LR4, SR8, AOC and third-party
- 100GbE: LR4, CWDM4, ER4, SR4, AOC, DAC and third-party
- 10GbE via MicroMux™ pluggable QSFP28
- FlexE support

Sleds variants

- 1200G dual channel sled: 12x or 8x 100GbE/OTU4
- 1200G dual channel sled: 3x 400GbE
- 800G CoreChannel sled: 8x 100GbE/OTU4, 2x 400GbE
- Submarine mode

Management

- Open interfaces
- YANG-model based
- Support for CLI, REST, NETCONF, SNMP and WebGUI
- Streaming telemetry (gRPC)
- Secure software and configuration management

Automation and simplicity

- Zero-touch provisioning
- Script-based commissioning
- Integration into SDN environments
- Simplified local provisioning options

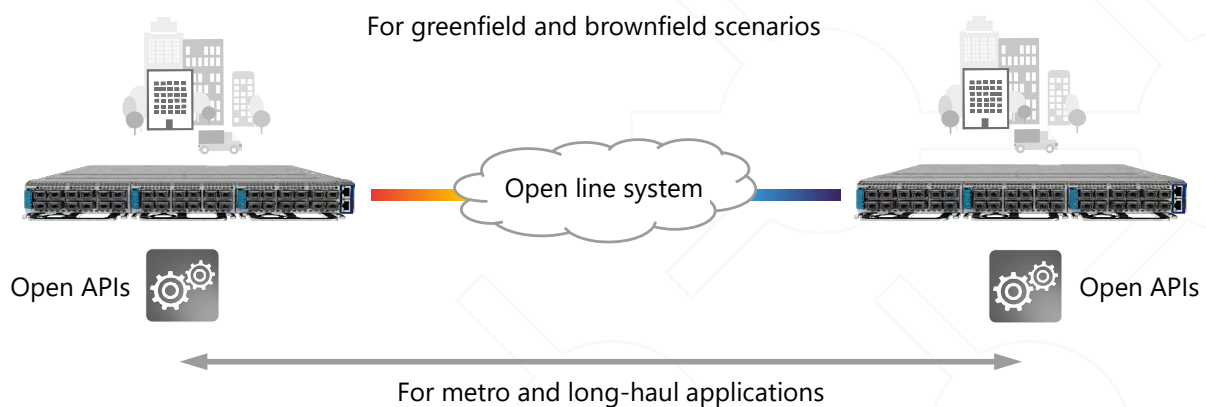
Best-in-class ecodeign

- Highly-efficient design with market leading power efficiency
- <0.16W per Gbit/s
- 80+ platinum PSUs
- 1+1 hot-swappable PSUs (105-230VAC, HVDC, +/-48VDC)

Applications in your network

Boost network capacity over any infrastructure

- Data center interconnect with up to 1.2Tbit/s per channel
- Maximize capacity or extend the reach of installed legacy infrastructure (fixed grid or flexgrid) without optical line system upgrade
- Submarine network applications with maximum bandwidth per channel



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