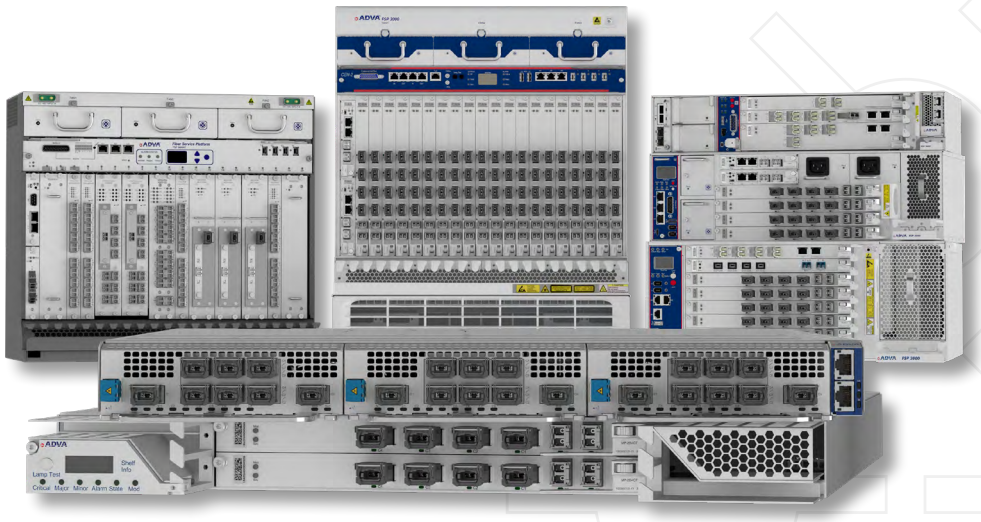
FSP 3000

Open, secure and efficient terascale networking

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 secure, 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, our FSP 3000 enables secure optical network solutions that can scale and accommodate tomorrow's needs. As the first commercial post-quantum cryptography (PQC) optical transport solution, our FSP 3000 now also protects data against cyberattacks from quantum computers. 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 channels with up to 800Gbit/s per line port; 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 a metro-optimized 2-degree ROADM to multi-degree ROADMs for flexgrid optical layer
- **Quantum-safe ConnectGuard™ encryption**
  Layer 1 encryption with ultra-low latency and 100% throughput, FIPS and CC certified; BSI approval; PQC cryptography with hybrid key exchange system

High-level specifications

General information

- 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

Client services

- From 100Mbit/s to 425Gbit/s
- Ethernet up to 400GbE, RoCE, CE LR
- OTU-1/2/3/4, OTUCn
- SONET/SDH up to 10Gbit/s
- Fibre Channel up to 64GFC
- ESCON, FICON, Coupling Link, Infiniband
- CPRI up to eCPRI

Terminals

- Fixed line (<=100Gbit/s) and SW-defined (>=100Gbit/s) transponders/muxponders
- Up to 400Gbit/s per 1-slot card
- Up to 800Gbit/s per channel
- Up to 3.6Tbit/s per 1RU chassis
- 400 / 1200Gbit/s OTN switches
- 10Gbit/s QSFP-based service multiplexer (MicroMux™)

Photonic layer architectures

- DWDM: up to 128 channels
- CWDM up to 16 channels
- Hybrid CWDM + DWDM
- Wide variety of filters and ROADM options up to 32 degree
- Coherent and direct detection (PAM4) based solutions
- Optimized OLS for 400ZR DCI
- Optical timing channel (OTC) and fiber monitoring (OTDR)

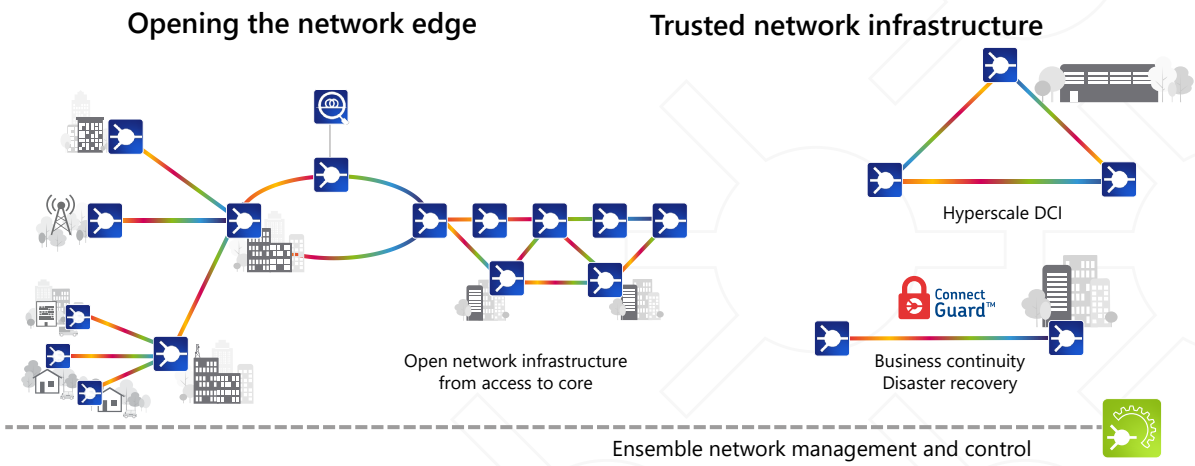
ConnectGuard™ encryption

- Layer 1 AES-256 encryption
- Dynamic key exchange <=4096 bit keys every minute
- FIPS 140-3 and CC EAL-2 certified. BSI approval for German (“VS-V”) and NATO-restricted (“NATO confidential”) data
- Encryption options via QKD and post-quantum cryptography

Power and environmental

- Highest energy efficiency, TEER-proven ecodesign
- Redundant power supplies for -48VDC or 100-240VAC PSUs
- Variety of active and passive chassis from 1RU to 12RU; 19in/ETSI/NEBS rack mounting
- Extended temperature options

Applications in your network



End-to-end network infrastructure

- Scalable system architecture for cost-effective access, metro and backbone optical network infrastructure
- Open optical networking solution for turnkey as well as disaggregated use cases

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

For more information please visit us at www.adva.com

Product specifications are subject to change without notice or obligation.

Wavelength technologies
- CWDM: 16 wavelengths/20 nm according to ITU-T G.694.2
- DWDM schemes
  - 4, 8, 16, 40 channel, C-band, 100 GHz spaced
  - 80-channel, C-band, 50 GHz spaced
  - 96-channel, C-band, 50 GHz spaced
  - 128-channel, C-band, 37.5 GHz spaced
  - Flexgrid with down to 6.25 GHz channel width granularity
- Hybrid CWDM/DWDM

Topologies
- Point-to-point
- Point-to-multipoint
- Linear add/drop
- Multiplexed add/drop (drop and continue)
- Ring (+ feeder + dual homing)
- Hubbed-ring
- Meshed

Services
- Ethernet: FE, GbE, 10GbE (LAN and WAN), 25GbE, 40GbE, 100GbE and 400GbE, 10G and 25G RoCE, CE LR
- ESCON and Fibre Channel/FICON 1Gbit/s, 2Gbit/s, 4Gbit/s, 8Gbit/s, 10Gbit/s, 16Gbit/s 32Gbit/s, 64
- InfiniBand 5G and 10G
- STM-1, -4, -16, -64 / OC-3, -12, -48, -192
- OTU-1, -2, -3 and -4, OTUCn
- CPRI up to rate 10 (eCPRI)

Service protection
- Versatile protection
- Channel protection
- Path protection
- Channel card protection
- Client layer protection

Channel modules with fixed line format
- Transponders (line capacity up to 100Gbit/s)
- Muxponders (aggregating services in the range from 100M to 40G)
- Add/drop multiplexers (dynamic routing of sub-aggregate traffic 100M to 10G services)

Channel modules with SW-defined line optics
- Trans-/Muxponders (aggregating services in the range from 10G to 400G, line capacity up to 800Gbit/s)
- OTN switch and add/drop multiplexer (for sub-aggregated services from 10G to 100G)

Optical layer
- Fixed filter from 1 to 128 channels WDM
- Reconfigurable optical add/drop modules (ROADM) from 1 to 32 degrees with multiple fixed, colorless, directionless and contentionless add/drop structures
- Multiple amplifications solutions using Erbium fiber and/or Raman amplifiers
- Automated optical layer with channel equalization and span loss equalization
- Optical supervisory functions like optical channel monitoring with full support of third-party wavelengths
- Tailored solutions for access, metro and regional/long-haul infrastructure (e.g., filterless OLS for coherent access, metro data center interconnect, etc.)
- Dedicated amplifier suite for coherent and direct detect signals (like SmartAmp™ designed for PAM4 solutions)
- Dedicated OLS optimized for 400ZR DCI links at over 25Tbit/s per fiber pair

Common equipment
- 1RU, 2RU, 3RU, 4RU, 7RU, 9RU and 12RU shelf variants
- 1RU extended temperature shelf
- Power supply modules from 50 to 1200W (AC, DC, full redundant)
- Various controller modules (from compact to redundant and high performance)
- Multiple management interfaces (USB, RJ45, digital IO-housekeeping)

Equipment management
- Embedded CRAFT/CLI
- Embedded web-based graphical user interface with “point and click” provisioning via HTTPS
- Full support of SNMP, TL1, REST, NETCONF (OpenConfig)
- Streaming telemetry (gRPC)
- Full support of FTP, SFTP, SCP, SSH, TELNET
- Remote authentication via RADIUS or TACACS+
- Equipment management using DCN or in-band management tunnels
- Enhanced user management with multiple security options
- Zero-touch provisioning methods using automated set-up, scripting environment like Ansible and network-wide profile management
- Use of augmented reality and equipment identification for guided installation and fault identification

Laser safety
- Class1M laser product with hazard Level 1M

Environmental
- Standard temperature (operating): +5°C to +40°C
- Extended temperature active (operating): -40°C to +65°C
- Extended temperature passive: -40°C to 85°C
- Relative humidity (non-condensing): 5% to 85% (operating) / 5% to 90% (short-term)
- Outdoor enclosures for passive components

Regulatory compliance

- ETSI EN 300 019-1-1 V2.2.1 Storage class 1.2
- ETSI EN 300 019-1-2 V2.2.1 Transportation class 2.2
- ETSI EN 300 019-1-3 V2.4.1 Stationary use at weather protected locations class 3.1
- ETSI EN 300 019-2-3 V2.4.1 Non- temperature controlled, weather protected locations Class 3.3E (-40°C to max +65C) for extended temperature shelf configurations
- NEBS level 3
- Laser safety: IEC 60825-1, IEC 60825-2, ITU-T G.664-2012
- EMC: CISPR 22, CISPR 24 / CISPR 32, CISPR 35
- Product safety: IEC 60950-1, IEC 62368-1:2014
- Directive 2011/65/EU (RoHS II) and 2015/863/EU (RoHS III)
- WEEE: directive 2012 / 19 / EU, EN 50419:2006
- IP20. Use in a pollution degree 2 environment and indoor controlled office environments only
- CE declaration of conformity
- FCC supplier's declaration of conformity
- WCAG 2.0 certification for embedded web GUI