Adtran

Solution brief

FSP 3000 IP OLS

Point-to-point coherent ZR interconnects made simple

Highlights

- **Open line system optimized for short ZR-based interconnects (120km+)**
- **Supports Adtran or third-party coherent interfaces up to 1,6Tbit/s**
- **Zero-touch provisioning (ZTP)**
- **Built-in channel and fiber monitoring**
- **Automated span equalization**
- **Open programmable interfaces**
- **Three compact variants for 8- up to 65-channel capacity**
- **Ultra-compact OLS configuration offering 8 channels (expandable via passive shelf to 16) up to 1.6Tbit/s, ZTP, automated span equalization and integrated fiber and channel monitoring in a 1RU chassis**

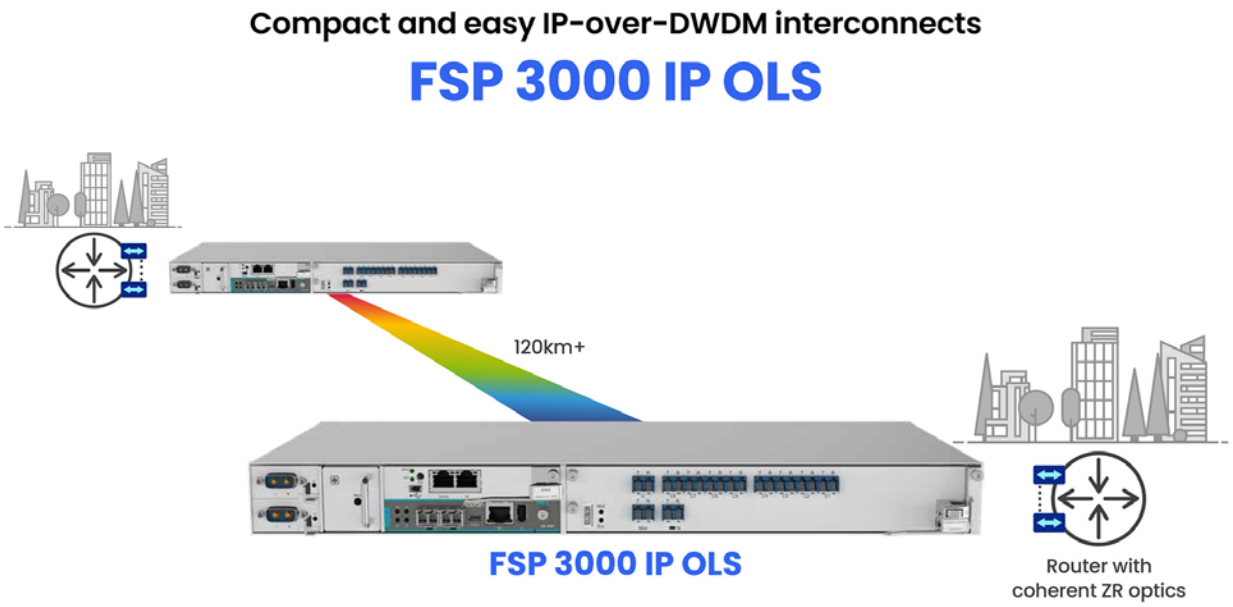
The Adtran FSP 3000 IP OLS is a new family of open optical line system (OLS) solutions within the FSP 3000 product line. Purpose-built for IP-centric networks, it supports point-to-point interconnects that utilize ZR and ZR+ coherent optics in IP over DWDM (IPoDWDM) architectures.

The FSP 3000 IP OLS features compact, user-friendly configurations that simplify operations and streamline troubleshooting. It enables efficient transport of ZR/ZR+ optics at speeds up to 1.6Tbit/s, with a range of scalable variants to meet evolving network needs.

The latest addition to the family is a highly integrated OLS configuration that supports eight wavelengths at speeds up to 1.6Tbit/s and includes an upgrade port for expansion to 16 channels. It features integrated channel and fiber monitoring technologies as well as fully automated setup and power leveling procedures, all housed in a compact 1RU form factor.

Whether used in data center interconnects, carrier applications or private enterprise networks, our FSP 3000 IP OLS enables compact, high-capacity and fully automated ZR-based interconnects that can be easily operated, even without optical expertise.

FSP 3000 IP OLS



IPoDWDM interconnects

Driven by the growing need for high-speed data transmission and more efficient network infrastructure, a clear shift is emerging. Design principles traditionally applied in IP networks are now being mirrored in optical transport. This evolution is giving rise to a new type of optical infrastructure consisting of cascades of relatively short point-to-point links using DWDM coherent ZR/ZR+ optics, often plugged directly into routers as part of IP over DWDM (IPoDWDM) network architectures.

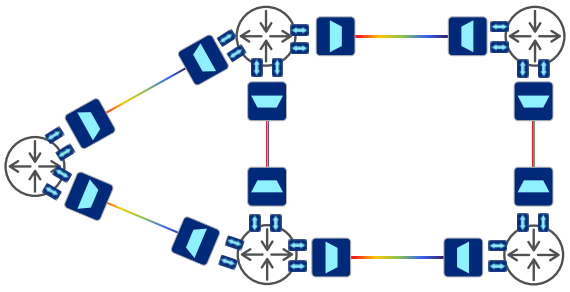


Figure 1: Example of an IP-centric network example with DWDM ZR/ZR+ optics plugged into routers (IPoDWDM)

One significant benefit of this approach is the simplification it brings to network planning and operations. Yet, even with these architectural changes, operating the optical line system itself remains complex – often requiring specialist knowledge for tasks such as optical link planning, power balancing and manual setup during service turn-up. The Adtran IP OLS Series is designed to remove these barriers and support this new class of IP-centric optical networks.

FSP 3000 IP OLS

The Adtran IP OLS Series offers compact OLS configurations that are simple to operate and troubleshoot, and have been optimized for ZR/ZR+ coherent point-to-point interconnects with wavelengths up to 1.6Tbit/s. It provides coherent ZR-based interconnects that hide the complexity of the optical analog layer from users. Product variants are available to meet transport capacity demands up to 65 wavelengths. All variants feature a compact design that integrates advanced channel and fiber monitoring, along with automated power leveling procedures.

For 100G, 400G, 800G and 1.6T

The latest addition to the IP OLS family is an ultra-compact solution that combines pre- and booster amplification with an 8-channel mux/demux filter in a single high-density card that can be housed within a 1RU chassis. This ultra-compact FSP 3000 IP OLS configuration supports a wide range of Adtran and third-party ZR coherent optical transceivers with speeds of up to 1.6Tbit/s and offers scalability for up to 16 wavelengths. What's more, its optical amplifiers automatically manage power levels between the two termination points and include an integrated suite of channel and fiber monitoring technologies that continuously track wavelength, spectrum utilization and fiber integrity.

Figure 2: Compact FSP 3000 IP OLS in a 1RU, 300mm depth ETSI compliant all-front-access chassis

Ease of use without optical expertise

The FSP 3000 IP OLS provides a plug-and-play optical layer that can be easily operated and managed without optical expertise. With zero-touch provisioning technology, setup requires minimal manual intervention. Once deployed, the FSP 3000 IP OLS features automatic operation, with no further provisioning or management interaction required.

An automated span equalization process continuously monitors power levels and, if required, adjusts amplifier gain, tilt and output power to maintain optimal performance. If the network changes, for example, when a new channel is added or when the fiber attenuation changes, the OLS automatically rebalances the spans without user intervention.

By automating these tasks, the FSP 3000 IP OLS hides the optical layer complexities from the user and provides the optimum spectral configuration to achieve the best optical performance throughout the system's lifespan.

Easy troubleshooting

The FSP 3000 IP OLS is designed for easy network troubleshooting. It features advanced optical channel and fiber monitoring capabilities that help users quickly identify and locate faults, minimizing downtime and improving operational efficiency.

Built-in optical channel monitoring (OCM) technology continuously measures and analyzes the performance of individual channels, tracking key parameters such as channel power to support fault detection and performance optimization. Additionally, the FSP 3000 IP OLS is equipped with an optical time-domain reflectometer (OTDR) that helps pinpoint and identify fiber failures – such as breaks or degradation – and provides visibility into the condition of the connected fiber plant. It can also detect changes in fiber routes, helping operators verify maintenance activities and ensure service providers are meeting agreed standards.

Deployment flexibility

The crucial component of the compact IP OLS configuration is a card that integrates all optical layer functions and technologies. This "all-in-one" card can be installed in FSP 3000 1RU chassis, which are equipped with pluggable, redundant power supply units (PSUs) and fans. Two 1RU chassis options are available: a 300mm ETSI-compliant, all-front-access chassis, and a 600mm version with front-to-back airflow and front and rear access (for fan units and PSUs). Both chassis options support AC and DC PSUs.

Figure 3: "All-in-one" card integrating all optical layer functions .

The card can also be installed in any of the other FSP 3000 chassis options. This versatility makes the Adtran IP OLS suitable for a wide range of applications in data center, enterprise or carrier environments.

Figure 4: FSP 3000 IP OLS in a 1RU, 600mm depth chassis with front-to-back airflow

"FSP 3000 IP OLS provides compact and easy IPoDWDM interconnects"

FSP 3000 IP OLS

High-capacity configurations

In addition to the ultra-compact variant, the IP OLS Series offers two configurations that provide up to 33 and 65 channels, respectively. These options enable higher-capacity, ZR-based interconnects that typically cover distances of up to 120km over single-mode fiber (SMF) and are easy to operate and troubleshoot.

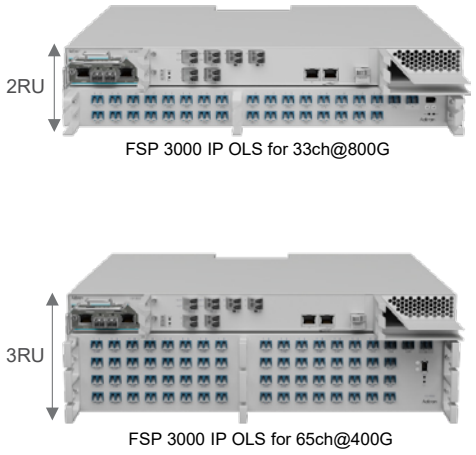


Figure 4: High-capacity FSP 3000 IP OLS variants

Management

As part of the FSP 3000 product family, the FSP 3000 IP OLS features a full set of management options. While the system supports zero-touch provisioning, many users will still want to access its intelligent features for network monitoring and control.

Local management is available via CLI and GUI options, while standards-based northbound interfaces support integration into network management systems, orchestration platforms and in-house operational tools such as Python and Ansible. This rich set of options works well for small deployments and can scale indefinitely to meet the needs of larger networks.

Infrastructure as a service

FSP 3000 IP OLS greatly simplifies design, deployment and operation – but to go from a low-effort solution to a no-effort solution, Adtran provides a comprehensive range of services to meet all your needs. From the initial installation and commissioning of equipment to ongoing maintenance and repairs, we ensure your systems operate smoothly and efficiently. Additionally, we offer a spare pool to keep your operations running without interruption.

Our dedicated team is committed to delivering top-notch service at every stage – ensuring reliability, continuity and excellence throughout the lifecycle of your network.

Building on this approach, Adtran is also addressing the growing customer interest in “optical Infrastructure as a service.” This model allows customers to move to an operational expenditure (opex) model for their optical networks. Adtran offers a flexible suite of services to manage the network according to individual needs – from customer care and managed services to fully outsourced operations and resident engineering. The result is a truly turnkey optical infrastructure experience.

Portfolio of coherent ZR pluggable optics

The FSP 3000 IP OLS is fully compatible with both Adtran and third-party coherent ZR pluggable optics. Adtran provides a complete portfolio of coherent transceivers, ensuring end-to-end optical performance across the network. These pluggable transceivers can be used across any IP or switching platform, as well as within the FSP 3000 system.

By delivering both an open line system and a fully compatible portfolio of coherent pluggables, Adtran offers a single point of contact for optical technology purchases along with end-to-end performance assurance, problem resolution and RMAs for all optical technologies within the network – simplifying operations and support.

Over three decades of expertise

Adtran led a major industry shift by being the first to adopt a transponder-less network architecture for hyperscale DCI. With more than 30 years of expertise building optical networks that add value, we remain at the forefront of network innovation and customer-focused design.

Our FSP 3000 IP OLS is purpose-built to meet the growing demand for IP-centric networks, offering exceptional scalability and operational simplicity. Trust Adtran to support your transition to a more open, efficient IP-optimized optical infrastructure.

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