



# FSP 3000 Edge OLS

Unlocking the coherent optical edge

## Highlights

- Cost-efficient, flexible and scalable optical layer optimized for the transport of coherent wavelengths at the optical edge
- Harnesses the latest 100ZR and 400ZR coherent optics, maximizing use cases at optical edge infrastructure
- Supports any coherent interface and baud rate
- Compact nodes with very low power consumption
- Hardened, carrier-grade equipment, suitable for outdoor deployments, such as street cabinets
- Flexible configuration

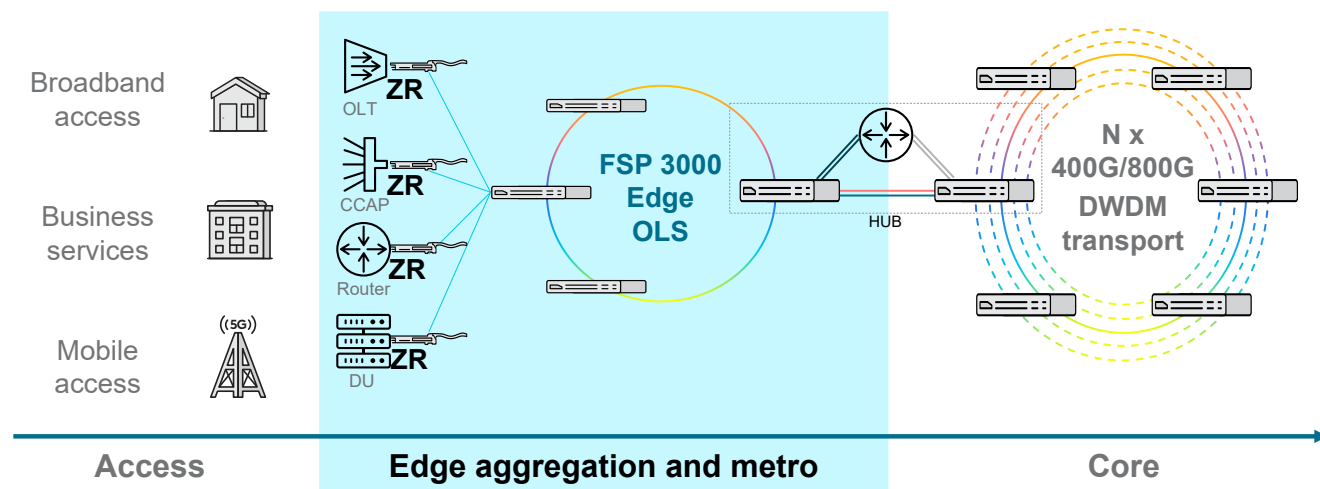
## The new coherent optical edge

Initially driven by hyperscale data center operators, the potential of ZR coherent pluggable optics has now caught the attention of communication service providers. They'd like to use these devices for a cost-effective introduction of coherent technology deeper in the optical edge, replacing legacy 10G/s direct detect connectivity and addressing soaring bandwidth demands.

Coherent ZR optics offer cost-efficiency but at the expense of performance compromises. This limits their use cases primarily to point-to-point links. The optical layer plays a key role in expanding the number of applications of ZR coherent optics at the optical edge.

Our new FSP 3000 Edge Open Line System (OLS) has been engineered to enable a cost-efficient, flexible and scalable optical layer that empowers users to harness ZR coherent optics, and any other type of coherent interface, in optical edge network infrastructure.

# FSP 3000 Edge OLS



## ZR coherent optics in optical edge networks

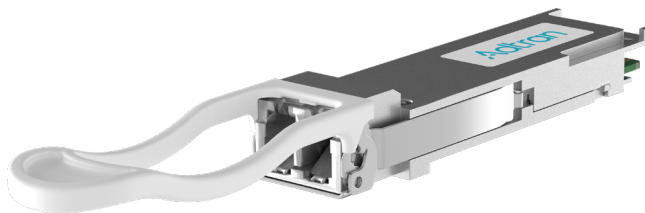
More and more service providers and network operators are willing to adopt ZR coherent pluggables in their networks, especially in metro and edge aggregation networks. However, the limited optical performance of this type of interfaces, compared to traditional transponder-based solutions, usually limits the number of use cases in optical edge network infrastructure.

The optical layer plays a crucial role in adopting ZR coherent optics deeper into the optical edge. ZR optical specifications have been optimized to develop cost-efficient pluggable transceivers that fit in small form factor pluggable modules and have low power consumption. These adaptations lead, among others, to lower optical output power than transponder-based options, which limits the number of applications in optical edge network infrastructure.

Operators need an optical layer that maximizes the use of ZR coherent optics in their network infrastructure, while still addressing stringent cost and operational requirements, such as the need for compact, and hardened equipment that can be installed outside the central office.

## Adtran FSP 3000 Edge OLS

The Adtran FSP 3000 Edge OLS is a DWDM open line system that has been engineered to enable cost-efficient coherent access, edge aggregation and metro transport networks that are easy to deploy and operate and can scale to meet today's and tomorrow's traffic demands. Featuring ZR-optimized technology, it empowers users to harness ZR coherent optics at the optical edge.



Adtran Coherent 100ZR  
100ZR QSFP28 pluggable transceiver

## For 100G, 200G, 400G and beyond

Whether point-to-point, linear add/drop or tree topologies, our FSP 3000 Edge OLS maximizes the transmission performance and flexibility of ZR coherent optics and any other type of coherent interface.

Moreover, an optical gridless spectrum design facilitates the transport of any coherent speed and baud rate, ensuring a scalable and future-proof network infrastructure.

## Flexible networks without active wavelength routing

FOADMs have been widely used in access networks. They offer a cost-efficient solution for routing services in networks with moderate traffic. However, with a fixed wavelength grid, the channel bandwidth limits the scalability to higher speeds and baud rates. Moreover, FOADMs only offer static routes, so any reconfiguration requires manual on-site operation, like reconnecting the patch panel.

Flexgrid ROADMs are an evolution that offers higher scalability and operational flexibility. Flexgrid technology removes fixed channel slots and lets the user define the spectral width of each wavelength. This allows the transport of any coherent speed and baud rate, and maximizes spectrum use. Moreover, ROADMs offer software-defined network reconfiguration and routing, which minimizes onsite operations and provides users with flexibility to accommodate changing traffic demands. However, the cost, footprint and high power of flexgrid ROADMs usually prevent their use in access networks.

With an innovative power-optimized broadcasting technology, our FSP 3000 Edge OLS offers a cost-efficient and flexible optical layer with very compact and low-power nodes that are ideal for coherent optical edge deployments. Passive

wavelength broadcasting technology offers distribution of all the wavelengths across network, so users are not restricted by static routes like with FOADM networks. And with a gridless optical architecture, it allows the efficient transport of any coherent speed and baud rate. This ensures optical network infrastructure that can scale and accommodate new coherent technology innovation.

## Low-loss technology

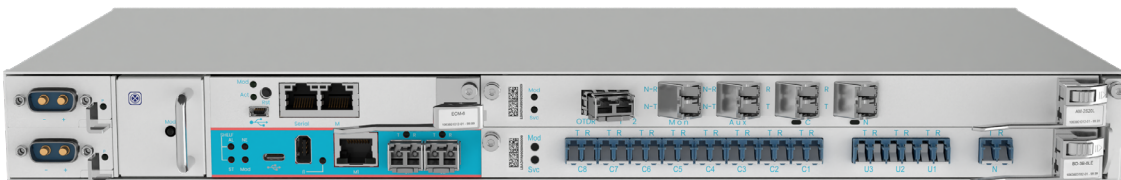
The transmission reach of coherent ZR optical interfaces is strongly conditioned by the insertion loss of the optical layer elements in the optical path. This is especially relevant in metro and access aggregation networks, where linear add/drop and hub-and-spoke topologies are predominant. In these networks, optical wavelengths must pass through several intermediate nodes without signal regeneration. For a given optical interface, the lower the insertion loss of the DWDM network elements in the optical path, the higher the transmission reach the coherent ZR optics can achieve without signal regeneration.

With low-loss technology, our FSP 3000 Edge OLS maximizes the transmission performance and use cases of coherent ZR optics. What's more, it eliminates the need for add/drop optical amplification. This further reduces the cost, footprint and power consumption of optical layer nodes.

## Flexible configuration

Our FSP 3000 Edge OLS solution comprises a family of modules that let users choose the options that cost-efficiently meet their demands.

High-density, multi-functional modules let users deploy compact, simple, low-power nodes. For example, our FSP 3000 OLS uses amplifier modules with pre- and booster amplification, OSC and OTDR, all in a 1-slot card.



Configuration example: Complete single-degree node in a 1RU, ETSI 300mm chassis suitable for outdoor deployments

# FSP 3000 Edge OLS

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## Mix and match with any FSP 3000 OLS solution

Most metro and edge aggregation networks use a hub-and-spoke traffic pattern. A single fiber pair interconnects customer sites. This minimizes fiber consumption and reduces costs over other solutions. Moreover, traffic in hub redundant configurations is sent along two paths and protected against fiber or node failures.

Our FSP 3000 Edge OLS solution has been optimized to efficiently support this type of network configuration. FSP 3000 Edge OLS nodes can be mixed and matched with other FSP 3000 OLS solutions, such as flexgrid ROADMs, in accordance with the demands of the use case.

## For indoor and outdoor deployments

Since many high data rate services are only effective at close range, more and more headend devices need to be deployed closer to the end user, often in outdoor deployments. The use of equipment that supports an extended temperature operating range has significant advantages for operators. It doesn't require heating and cooling systems, which have a major impact in terms of power consumption, space and node availability.

With a hardened, carrier-class design, FSP 3000 Edge OLS nodes can meet this growing demand. They can address a broad range of deployment options, including challenging ambient environments, such as street cabinets.

## Unlocking the coherent edge

Featuring compact and low power nodes and purpose-built technology, our FSP 3000 Edge OLS is the ideal solution to develop cost-efficient, flexible and scalable next-generation coherent optical edge networks. It empowers users to create an optical layer optimized for the transport of the latest coherent innovation, including 100ZR and OIF's 400ZR coherent optics – an optical layer that meets all critical cost, power and size optical edge requirements, while being ready to scale and support future transport demands.



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