XO20 optical terminus platform

Compact retention and precision optical alignment across connector formats

XO20 is a new XiOptics optical terminus platform designed to increase channel density while preserving individual fiber access. Its size-20-class packaging combines a discrete 1.25 mm ceramic ferrule, spring loading and a turn-and-latch retention feature with a controlled rotational reference.

The design focuses on the space surrounding the optical interface. Compact retention allows more channels to occupy a given connector envelope while retaining the alignment, polishing and service advantages of discrete optical termini.

Push turn and release

Push the terminus into the rear cavity with its index aligned to the entry geometry. Turn to engage the retaining feature beneath the retainer. Release axial pressure so the spring seats the terminus in its retained and indexed position. The final installation angle, seating check and service tool will be defined by the released XO20 drawing and procedure.

Installation rotation and optical tuning are different operations. Tuning selects a preferred angular registry for the fiber core. The connector index preserves a defined reference after installation.

A defined density comparison

The shell-size 21 design comparison is 32 XO20 optical positions versus 16 in selected ARINC 801 and size-16 M29504 arrangements. This is a 2x channel-count design goal in the same nominal shell envelope. Final XO20 counts will be established by released insert drawings. It is not a claim that diameter, cable volume or system weight is reduced by half.



Illustrative equal-envelope channel counts. Not an insert drawing.

The optical interface

Precision independent of the connector format

A ceramic ferrule locates the fiber, and a precision alignment sleeve brings opposing ferrules into alignment. The optical interface remains discrete even when many termini are arranged in a dense connector insert.

Insertion loss depends on the complete tolerance stack: fiber geometry, ferrule bore and outside diameter, endface condition, sleeve fit, angular alignment and physical contact. Controlled endface geometry and cleanliness are therefore essential parts of the optical system.

Rotational indexing and tuning

Small offsets between the fiber core and ferrule axis contribute to mating loss. Tuning places that eccentricity within a preferred angular sector. Indexed retention can preserve the chosen registry through installation and servicing. Tuning does not eliminate unequal eccentricities, contamination, fiber mismatch or endface defects.

Spring loading and mechanical stability

Each optical channel needs sufficient axial travel and preload to maintain the intended physical contact across assembly tolerances. Spring force, travel, friction, retention strength and angular play must be evaluated as a system. More channels also increase the aggregate coupling-force requirement.

Precision metallic structures can provide stable locating surfaces and robust mechanical load paths. Environmental performance still depends on the cable, adhesive, plating, seals, spring and material interfaces. Metal construction alone does not establish a temperature, vibration or ingress rating.

Return loss and polish

Higher positive return loss means less light is reflected toward the source. PC and UPC endface options address different reflection requirements. Compatible mating polish, clean endfaces and stable physical contact are essential.

Performance documentation

XO20 optical acceptance limits and environmental ratings will be established for the released configurations. Performance documentation should identify fiber type, wavelength, launch conditions, polish, reference method, sample population and the tested assembly. Typical values, acceptance limits and development targets should remain distinct.

Configuration-specific specifications and test documentation define supplied performance.

Connector integration

One optical core across multiple interfaces

The common terminus provides the optical channel. The host connector supplies the coupling, mounting, alignment, protection and cable management needed by the application. A compatible XO20 insert or adapter is required; size-20-class packaging does not imply universal fit in electrical-contact cavities.

Platform	Integration approach
Circular connectors	Dedicated dense inserts in familiar shell envelopes, with guide features and accessible sleeve carriers.
Size 8 Adapter For Various Connector Types	An adapter packages an XO20 optical channel inside a compatible size 8 cavity, allowing mixed-mode connectors where applicable.
Metallic LC	A metal housing and latch surround the optical core in a defined LC-format mating interface.

Optical guidance before contact

Shell keys establish connector orientation. Guide features align the inserts before exposed ferrules can collide. Ceramic sleeves control ferrule alignment, while terminus indexing establishes rotational registry. These functions must be coordinated through the full mating sequence.

Size 8 adapters and metallic LC

For size 8 adapter integration, adapter retention and terminus retention are separate interfaces. Cavity shoulders, release direction, engagement depth and rear access must match the selected host connector. For metallic LC, the complete latch, ferrule datum, travel and mating geometry must be verified. A shared ferrule diameter alone does not establish compatibility.

Sealing is defined for the complete mating pair and cable interface. A metal connector does not extend the environmental rating of an arbitrary transceiver or adapter. Mating endface configurations must be compatible.

Service and application definition

Individual channel access

Discrete termini allow a technician to address an individual optical channel where the harness and enclosure provide access. A removable sleeve carrier can expose endfaces for inspection and cleaning. Whether other channels can remain operating depends on the selected connector, routing and approved service procedure.

The service method should preserve orientation, protect the ceramic parts and verify seating after reassembly. Cable bend radius, strain relief and optical-path isolation remain part of the procedure. Production instructions will define the actual XO20 tools and methods.

Define the application

Begin with the fiber and optical interface: single-mode or multimode, fiber dimensions, wavelength, polish and tuning requirements. Then define the usable connector envelope, channel count, mounting method and mating geometry.

Add the mechanical and environmental requirements: cable diameter and construction, strength-member retention, shock and vibration, temperature exposure, sealing, fluids, mating cycles and field-service access. These inputs determine which XO20 configuration can serve the system.

From architecture to released configuration

The production specification should link the terminus and host drawings to optical testing, force-travel measurements, retention and extraction checks, registry repeatability and environmental testing. Configuration-specific evidence provides a clear basis for selection and acceptance.

XO20 brings compact retention, controlled orientation and individual optical channels into one platform. This enables XiOptics to engineer dense connections across circular, size 8 adapter and metallic LC formats while keeping the optical interface central to the design.

Contact XiOptics

Discuss your application with XiOptics. Provide your connector envelope, channel count, fiber, cable and operating environment.

Architecture overview | November 2026 | Configuration-specific specifications govern supplied products.