FIBER OPTIC FLEX CIRCUIT (FOFC)

High-Density Fiber Optic Routing for Compact Systems

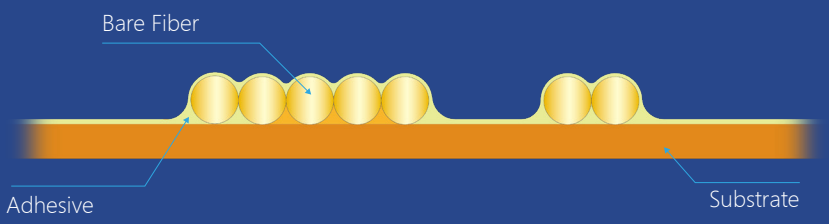
Customized, rugged, and space-saving fiber routing solutions for data centers and industrial systems.

T&S COMMUNICATIONS CO., LTD.

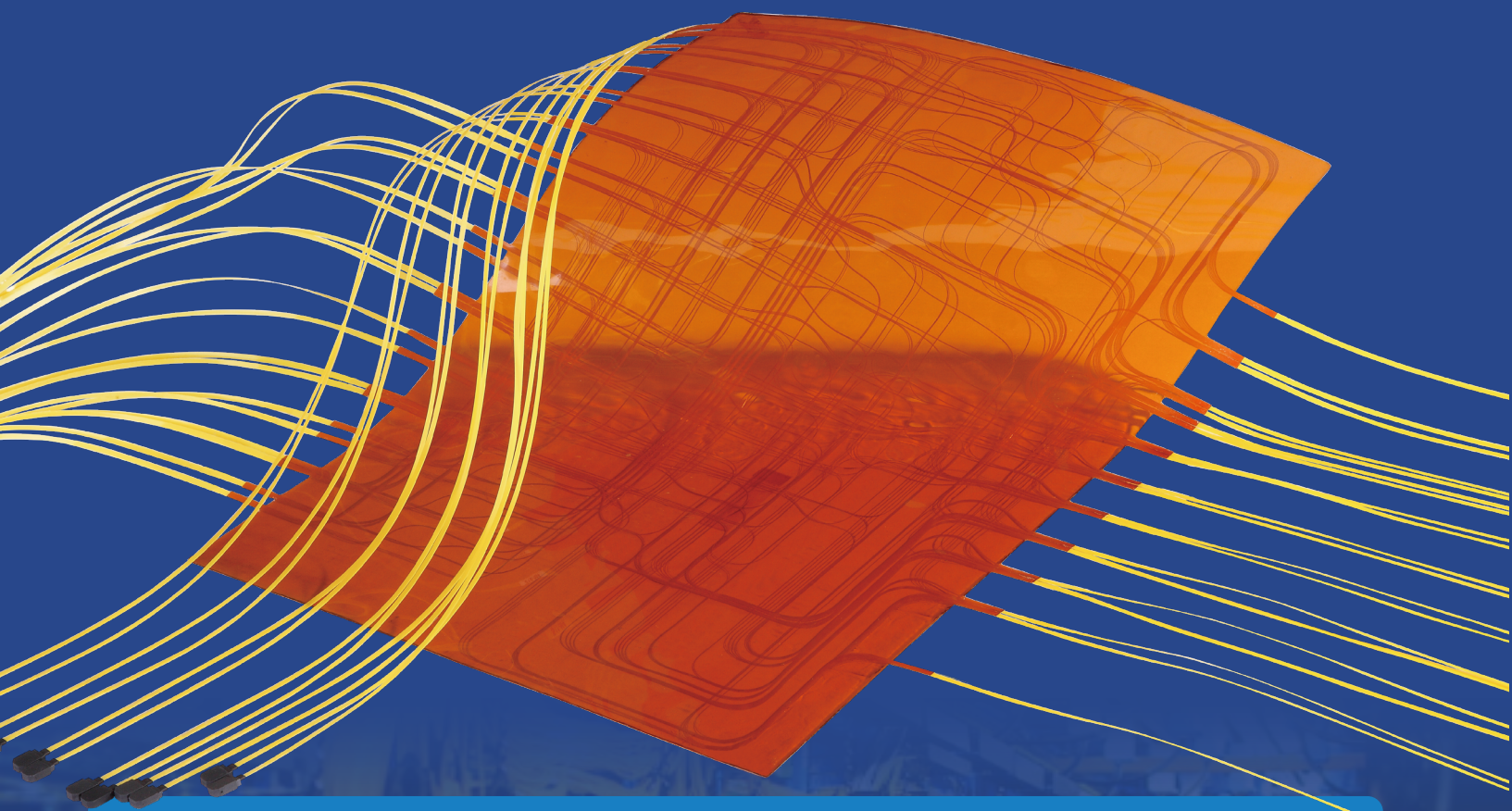
What is a FOFC?

FOFC (Fiber Optic Flex Circuits) are engineered fiber routing assemblies in which multiple optical fibers are precisely fixed into predefined pathways using specialized coatings and rugged substrates.

Designed for next-generation high-density interconnect architectures, FOFC replaces manual patch cord routing with a structured, predictable optical routing solution for data center fabrics, CPO systems, and HPC environments.



Cross-Sectional Diagram (Typical Structure Detail)



What Does It Do?

FOFC is primarily optimized for high-density shuffle architectures, where complex fiber re-mapping and routing stability are critical. By replacing patch cord management with predefined routing paths, FOFC:

① Organizes large fiber counts into structured shuffle layouts;
② Maintains consistent bend radius across dense routing zones;
③ Improves space utilization and airflow performance;
④ Reduces routing variability and installation complexity.

In addition, its customizable geometry allows precise adaptation to narrow, irregular, or mechanically constrained environments, supporting both complex shuffle and specialized non-shuffle routing applications.

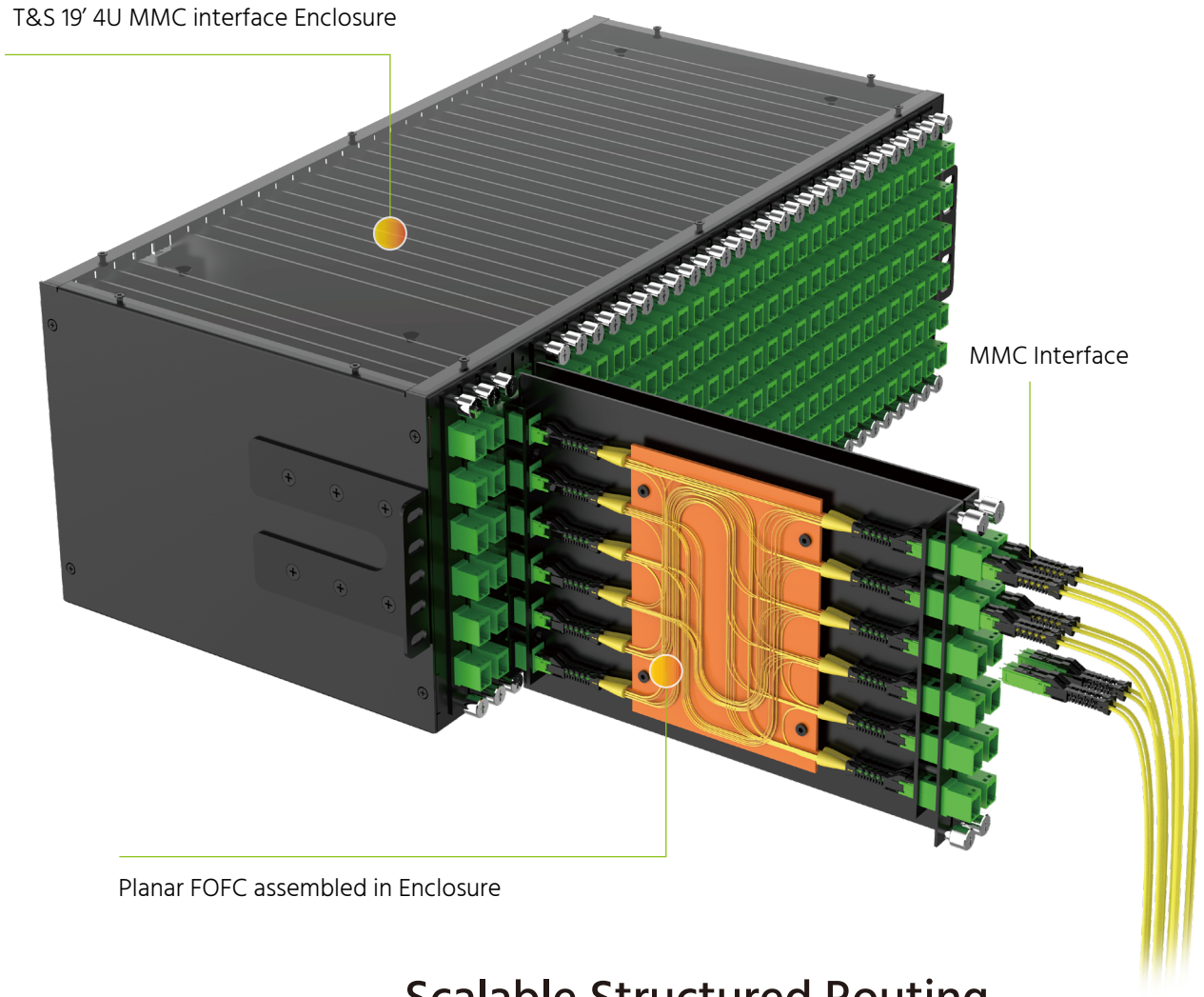
Three typical application scenarios enabled by two typical structural formats

Fully customizable FOFC structures,
typically delivered in planar or narrow-strip formats.

1 Data Center Mesh Shuffle

High-Density Structured Routing for Data Center Shuffle

Planar Format



Scalable Structured Routing

Data Center Fabrics

Modern data center fabrics require complex, high-density fiber re-mapping, where conventional patch cord routing leads to congestion, unmanaged bending, and limited scalability. Planar FOFC provides a structured shuffle platform with predefined pathways that organize large fiber counts into engineered architectures, enabling higher density, improved airflow, and predictable deployment across mesh networks.

2

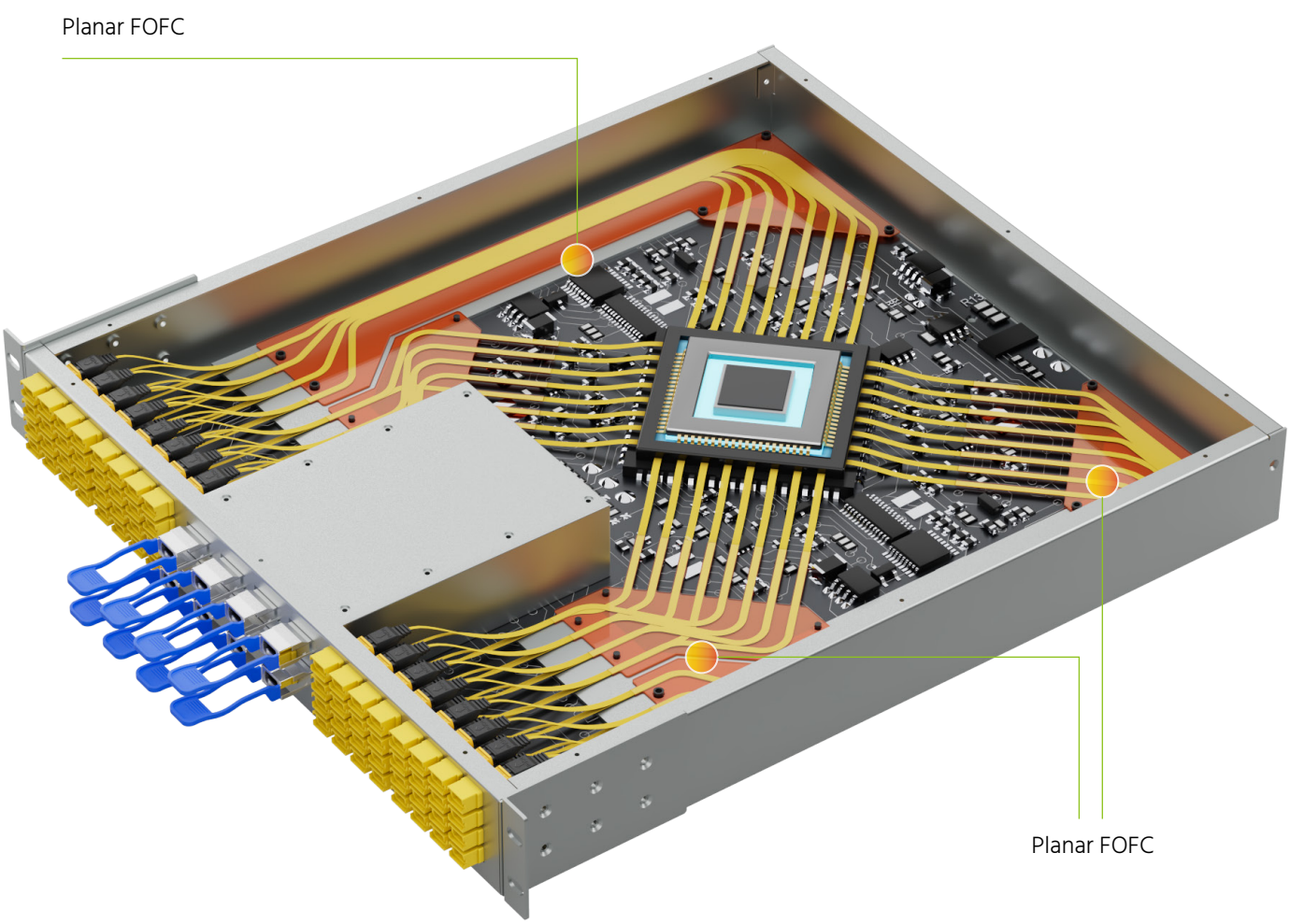
CPO Interconnect

Planar FOFC for high-density chip-to-chip optical routing

Planar Format

Precision Routing for Co-Packaged Optics

Co-Packaged Optics (CPO) demands ultra-high-density optical routing within tightly integrated chip-level environments. In such architectures, routing precision, mechanical stability, and space efficiency are critical to overall system performance.



Chip-Level Interconnect

Planar FOFC provides fixed, low-profile fiber pathways that enable controlled chip-to-chip optical routing with minimal variability. Its engineered layout supports stable integration and optimized bend management, meeting the stringent density and precision requirements of next-generation CPO systems.

3

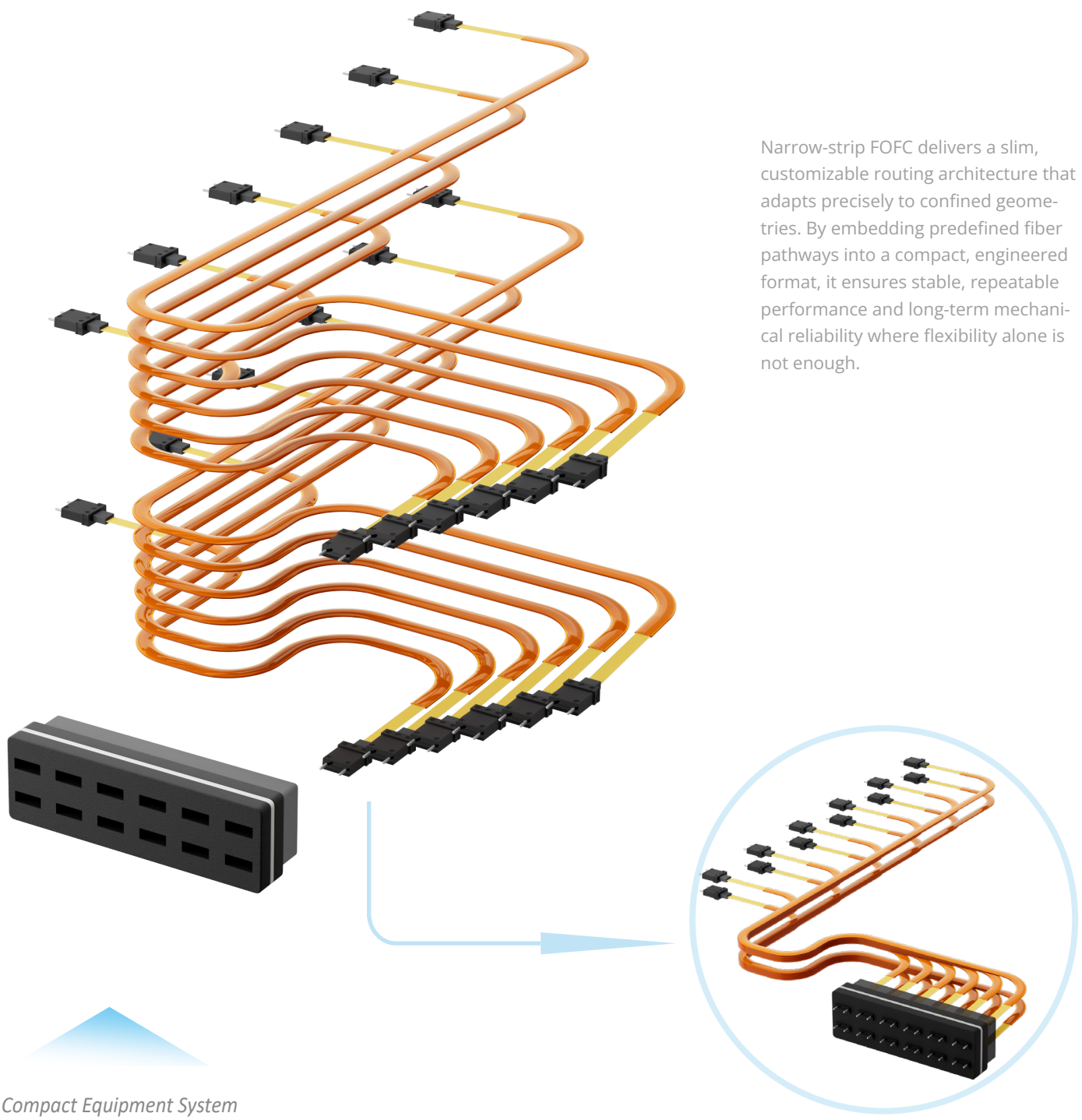
Space-Constrained Routing

Narrow-strip FOFC for tight or irregular installation spaces

Narrow-strip Formats

Controlled Routing for Constrained Spaces

In narrow or irregular installation environments, conventional fiber routing often results in congestion, inconsistent bend control, and increased installation complexity. Mechanical constraints further amplify routing instability and integration risk.



Narrow-strip FOFC delivers a slim, customizable routing architecture that adapts precisely to confined geometries. By embedding predefined fiber pathways into a compact, engineered format, it ensures stable, repeatable performance and long-term mechanical reliability where flexibility alone is not enough.

Compact Equipment System

PRODUCT FEATURES

Lightweight & Slim

Minimizes space and weight while fitting tightly into constrained layouts.

Highly Customizable

Configurable fiber pathways and shapes to match diverse application geometries.

Ultra-High-Density

Packs maximum fiber count into compact interconnects for dense systems.

Rugged and Reliable

Maintains stable performance under mechanical and environmental stress.

Flexible & Rollable

Soft and rollable for tight, irregular, or curved installations.

Modular & System-ready

Integrates seamlessly into larger assemblies for scalable deployment.

SPECIFICATION

ITEMS	UNITS	DETAILS
Fiber Type	-	Single-mode / Multimode
Fiber OD	μm	160-300
Thickness	mm	≤1.0
Dimension	mm	Up to 800 × 1000
Fiber Positioning Accuracy	mm	±0.01
Storage Temperature	°C	-40 to +85
Operating Temperature	°C	-10 to +60
Flammability Rating	-	UL 94 V-0
Insertion Loss	dB	＜0.1 (excluding connector loss)
Termination	-	MT-Based: MPO, MTP, MT Ferrule etc. Standard: LC, SC, MU, FC, ST etc. Others: MMC, MDC, SN, CS etc.
Fiber Leading-out Forms	-	0.6mm/0.9mm tube 2.0mm~3.0mm tube Ribbon fibers or discrete fibers

FIBER ROUTE DESIGN

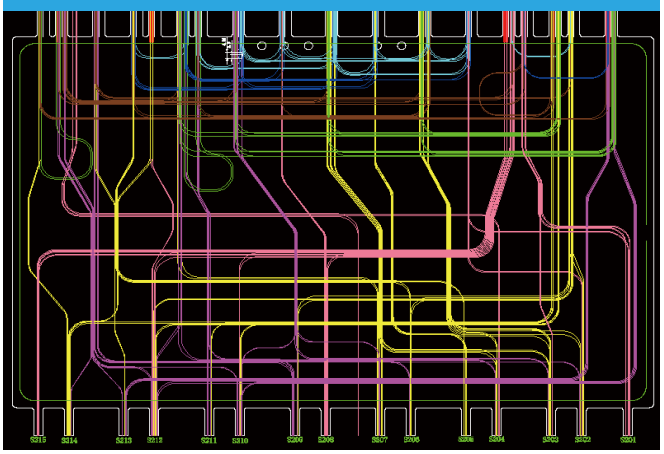
T&S Patented CAD Tool Suite for Instant Fiber Route Design

From routing logic to mass production — fully digitalized FOFC design

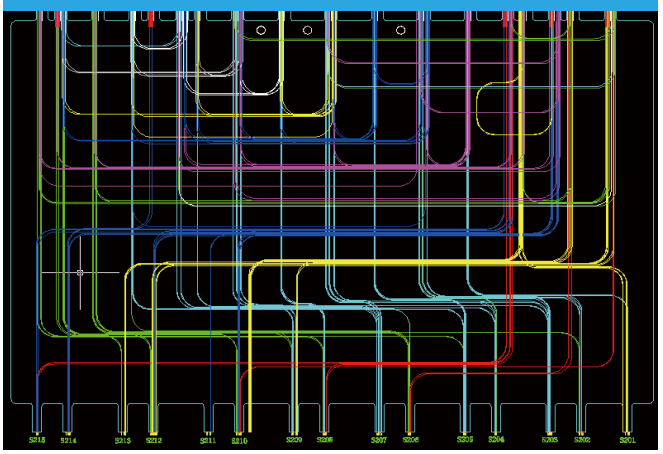
The T&S Fiber Route Design Tool Suite enables rapid, intelligent design of complex fiber routing schemes. Based on user-defined optical routing relationships, it generates optimized fiber layouts within seconds to minutes, performs routing simulations, and provides actionable optimization feedback.

By applying a set of design rules, the software minimizes signal loss, reduces bending risks, and enhances reliability—particularly in high-density optical configurations.

Manual Design



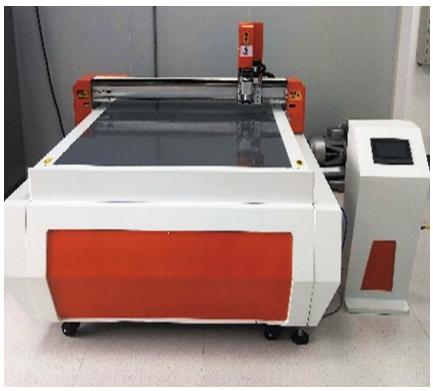
Software-generated Design



Compared to manual methods, the CAD Tool Suite significantly improves design efficiency and accuracy while reducing human error and ensuring premium optical performance across the system.

AUTOMATED PRODUCTION

Developed in-house and continuously upgraded through iterative innovation, our automated fiber placement platform forms the core of our FOFC manufacturing capability. Integrated cutting and adhesive curing processes deliver consistent, high-yield FOFC production. These capabilities establish our leadership in high-performance FOFC manufacturing.



Automated Substrate Cutting Machine

Automated Optical Fiber Placement Machine

Automated Adhesive Coating Machine

MORE PRODUCTS