

Fiber Optic Sensing Solution



Protecting **Perimeter Infrastructure** and **High-value Assets** is the need of the hour

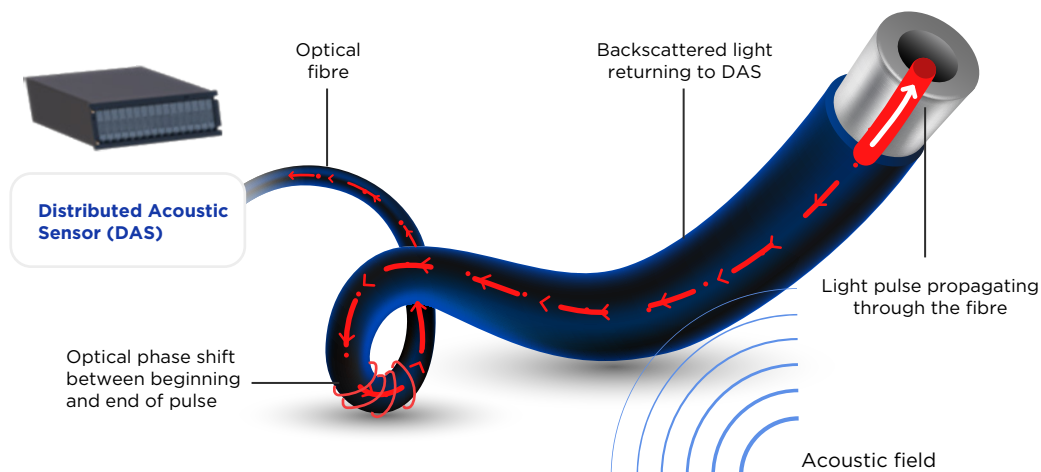
A growing number of high-value assets deployed for multiple industries are often not adequately protected against crime or infiltration. Detecting and deterring criminal activities such as theft, and trespassing requires continuous monitoring and surveillance. Any failure in providing protection and security over stretches of thousands of kilometers is not physically possible 24X7. One single breach could lead to a major repercussion. Technological innovation has led to the development of solutions for intrusion detection and securing high-value assets and critical infrastructure.

Optical fibre has sparked widespread interest due to its unique ability to function as a sensor. It has the capability to provide high-precision fault detection, high performance, and protection of data networks. It enables improved system uptime and availability by monitoring and anticipating accidental damage due to digging or other intrusive human activity. Fibre Optic Sensing Solution helps in Asset, Perimeter, and Network monitoring which are critical functions for securing infrastructure. It offers a wide range of benefits for companies of all sizes.

STL's Fibre Optic Sensing (FOS) Solution

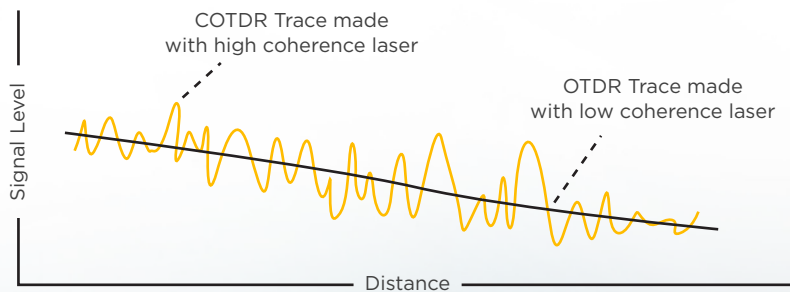
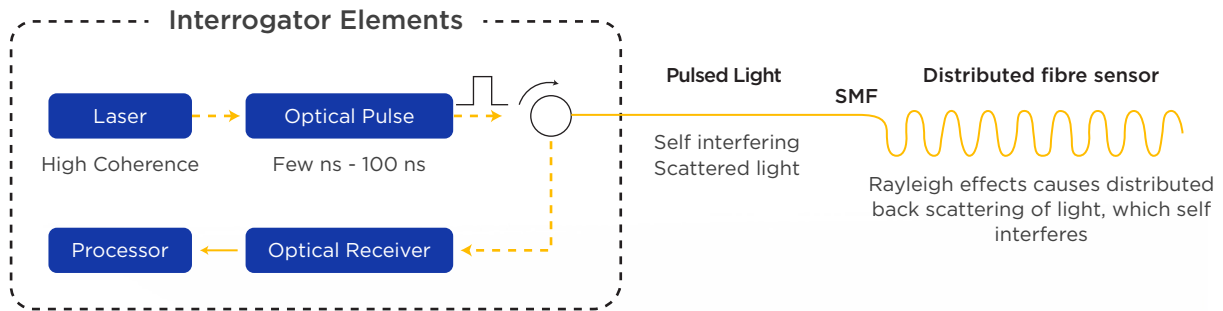
STL delivers a fully integrated and networked sensing solution based on Distributed Acoustic Sensor (DAS) coupled with an AI-enabled smart alarm system that helps to detect, inform, and defend with actionable insights. A DAS interrogator converts standard communications single mode fibre into thousands of extremely sensitive acoustic and vibration sensors. It senses the vibrations from various events around it, which could be several meters away.

As the data is processed in real-time, advanced signal processing and AI algorithms in our sensing solution recognize the unique pattern of each type of event. The events are detected, classified, and reported to the users through a GUI with actionable insights. The system can then show the users the precise locations and durations of the events and enable the user to make a timely and appropriate response.



FOS Working Principle

COTDR/OTDR Key Elements



With the DAS technique, also referred to as Coherent Optical Time Domain Reflectometry (COTDR), a perturbation along the fibre is detected by measuring the changes in the backscatter intensity from pulse to pulse.



Building Blocks of STL's FOS Solution

DAS Interrogator

Sends thousands of short pulses of light along the fibre every second and observes the backscattered light disturbed by the vibrations surrounding the optical fibre

Software module that controls various parameters in the DAS interrogator

Sensor Control Module

Pre-Processing Module

Converts huge data received from the DAS interrogator into meaningful data for easy visualization and processing

Deep Learning algorithm that detect and classify events based on the unique signature

Event Detection and Classification

Graphical User Interface

Web-based user interface to monitor events – type, location and time, configure zones, control user access, configure various parameters & settings, etc

Stores event-related information

Data Storage

API

Enables integrations with other applications

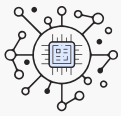


Sensing Hardware

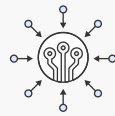


DAS Interrogator

Software Platform



Sensor Control Module



Ethernet Consumer



Pre-Processing Module



Waterfall plot



AI/ML: Event Detection and Classification



Graphical User Interface



Data Storage

Command Control Centre (CCC)



API

Integration Options

- CCTV
- GIS Map
- Smart Light
- Siren/Router
- SMS/Voice Message
- E-mail
- PA System

Features of FOS Solution



Advanced AI/ML-algorithm
-based solution



Detects and locates multiple
intrusions simultaneously



Both single (range*- 40+ km)
and dual (range*- 80+ km)
channel deployment



False/nuisance
alarm rate: < 1%



Event location accuracy:
 \pm 5-10 metre



Monitoring experience:
1.2 mn km.hrs



Probability of
detection: > 95%



Capable of detecting
and locating cable cuts



Identify and mark various
events with superior
confidence levels



Buried and fence
deployment



System
uptime: > 99 %



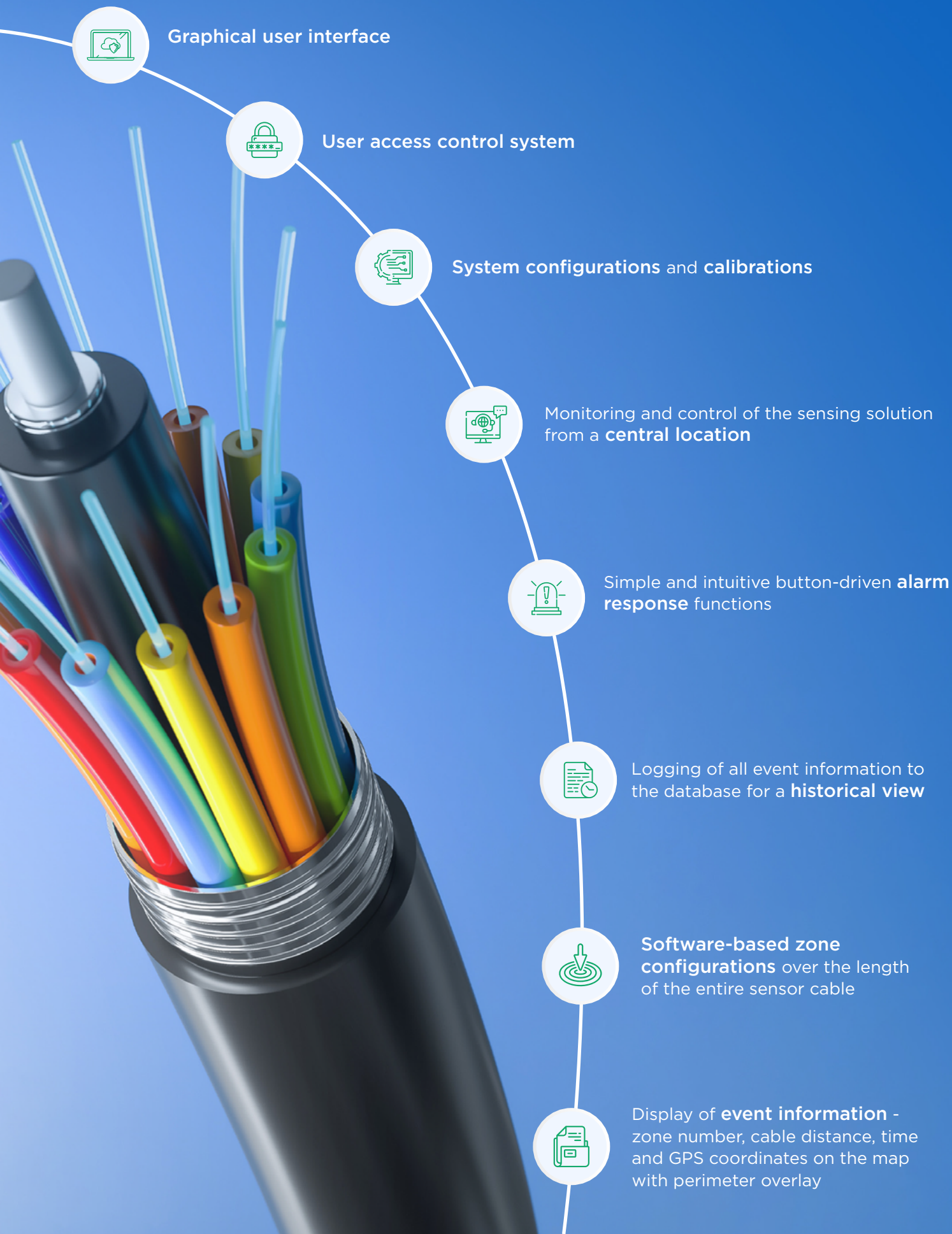
Response time
: 2-7 Sec



Detection range
(Depends on soil conditions
& event types)

- a. Human movement: up to 1-7 metre
- b. Vehicle movement: up to 4-20 metre
- c. Digging: up to 5-20 metre

Software Features



Our FOS Solution is **trained to Detect** and **Classify** Multiple Event Types

Our Smart Fibre Optic Sensing Solution prevents **intrusion activities** and **network unavailability** due to intentional or accidental fibre cuts. The system is tunable and machine learning algorithms are trained to detect different use cases. The solution is trained to detect and classify multiple events such as:

Human
Movement



Vehicle
Movement



Digging
Activity



Tunneling
Activity



Network
Intrusion
Monitoring



Flap
Monitoring



Creating **custom build** solutions

Leveraged
Across
Multiple
Segments



Border Security



Perimeter Security



Telecom Network Security



Pipeline Monitoring



Smart City Monitoring

STL FOS Advantage



*Prevents
fibre cuts*



*Early diagnosis, better prediction
and faster resolution*



*Make-in-India
Solution*



*Integration with
3rd Party Applications*



*Works with SM live fibre
or dark fibre*



*No change to
Network Design*



*Served multiple
Use Cases*



*No Special
Infrastructure Required*



*In-House
Support Team*



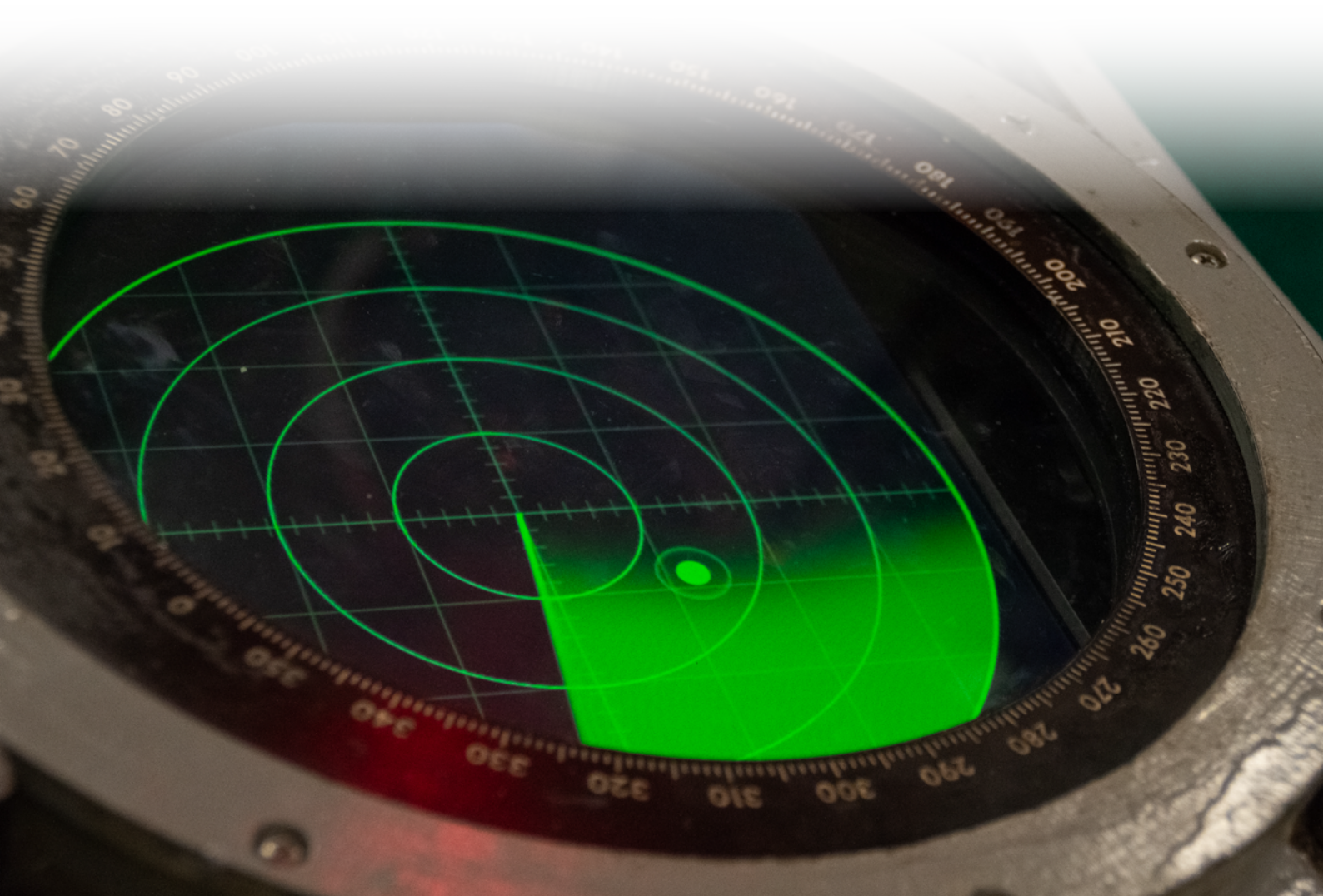
*Customization Applications
and AI-Models*



*End-to-End Solution Capabilities-
DAS, Fibre, and Software*



*Better management
of OpEx/CapEx*



About STL



USD 863
Revenue ^{Million}



50 MFKM
annual glass capacity



35 MFKM
annual cable capacity



650
Patent count

Optical Networking



Optical Networking solutions including fibre, cables and OI.

Global Services



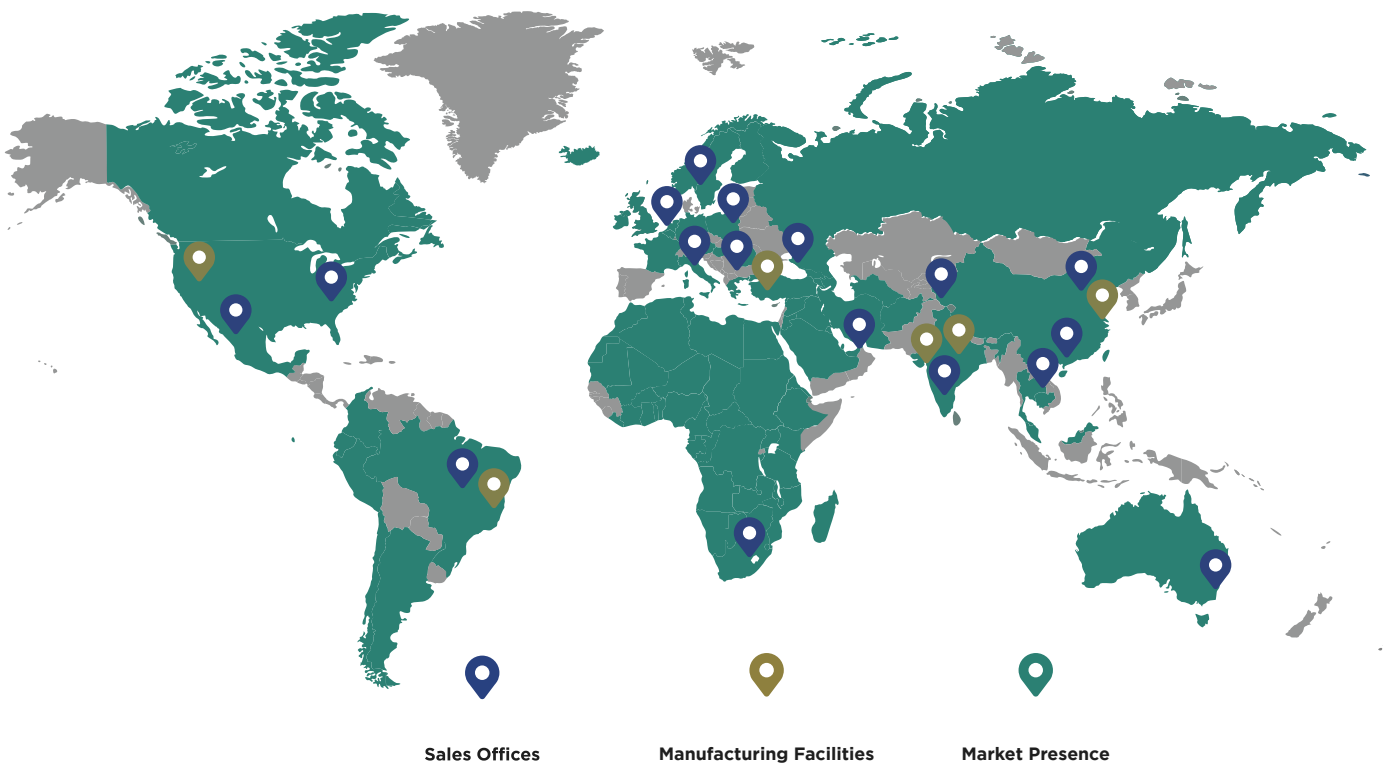
Unique digital integration expertise across the full stack.

STL Digital



Digital solutions and services across business verticals

Our presence



11
Production
Facilities

Glass Facilities
India China

Glass Facilities
India China

Cable Facilities
India Brazil
USA Italy

OI Facilities
India Italy

“Distrust and Caution
are the Parents of Security”

Benjamin Franklin





About STL - Sterlite Technologies Ltd

STL is a leading global optical and digital solutions company providing advanced offerings to build 5G, Rural, FTTx, Enterprise, and Data Centre networks. The company, driven by its purpose of 'Transforming Billions of Lives by Connecting the World', designs and manufactures in 4 continents with customers in more than 100 countries. Telecom operators, cloud companies, citizen networks, and large enterprises recognise and rely on STL for advanced capabilities in Optical Connectivity, Global Services, and Digital and Technology solutions to build ubiquitous and future-ready digital networks. STL's business goals are driven by customer-centricity, R&D and sustainability. Championing sustainable manufacturing, the company has committed to achieve Net Zero emissions by 2030.



Contact us at:

Phone: +91 9560552222

For queries or
demo email us: kuhu.rastogi@stl.tech