Sterlumiq

Where Power meets Intelligence

EVERY

City.

EVERY

Charge.

EVERY

Connection.

is powered by underground cables you can’t see.

A FRAGMENTED APPROACH

Today’s monitoring isn’t built for tomorrow’s grids

Electrical power transmission and distribution to centers of consumption requires aerial and underground cable networks. These networks have to be designed and built to ensure continuity of supply.

While previously, transmission and distribution operators relied on ordinary or traditional methods of maintenance to ensure continuity of supply, over time these conventional approaches have proved inadequate.

Time-based maintenance schedules cannot account for actual operating conditions, leading to either premature interventions or unexpected failures. The underground nature of cable infrastructure compounds this challenge as it is hidden from view, deteriorating silently until catastrophic failure occurs.

Underground cable systems present unique monitoring challenges, such as hidden cable deterioration, mixed network complexity, and access limitations. Predictive approaches through continuous real-time monitoring have become the only viable approach to protecting underground cable infrastructure and ensuring grid resilience.

Predictive approach to underground asset management helps with continuity of service, optimized asset utilization, reduced operational costs, higher problem identification accuracy, and enhanced safety of people.

THE COST OF BLINDNESS

With buried lines, come buried risks

When you can’t see the problem, the damage compounds across the entire value chain.

Complex Logistics.
Delayed Evacuation.
Curtailed Capacity.
Power Outages.
Halted Operations.
Grid Congestion.
Grid instability.
Slow restoration.
High OPEX.
Unexpected expenditure.
Lost Revenue.
Project Penalties.

Conservative Derating.
Project Delays.
Limited Visibility.
Fragmented Data.
Accidents.
Local Overheating.
Insulation Aging.
Cable Degradation.
Abrupt Repairs.
Delayed Fault Location.
Reactive Maintenance.

WHAT IS CAMOS

Turning invisible cable networks into intelligent, responsive infrastructure

CAMOS is built on advanced fiber-optic current sensing— bringing real-time electrical visibility to cable assets at scale.

CAMOS (Cable Advanced Management Optical System) is unique in measuring all types of currents within an electrical asset in module and angle while integrating FBG-based sensing at critical locations, capturing temperature, strain, and vibration across joints and terminations. Combined with distributed sensing technologies like DTS and DAS, CAMOS delivers a unified, continuous view of asset performance.

From insulation defects, poor jointing, unbalanced groundings, dynamic loads and oscillations, to cable health and transmission capacity monitoring, asset protection and precise fault localization, CAMOS transforms cables from passive infrastructure into intelligent, self-aware systems.

These measurements are captured in real time and processed through analytics engines that detect anomalies and fault signatures. Integrated dashboards and alert systems translate this data into actionable insights, enabling operators to monitor asset health, predict failures, and respond proactively across the cable lifecycle.

Advantages of CAMOS

PREDICTIVE MAINTENANCE

Catches failures before they happen

FAULT DISCRIMINATION

Discriminate fault origin in mixed lines

FAULT LOCATION

Take the guesswork out of the groundwork

DYNAMIC CABLE RATING

Optimise cable performance for higher efficiency

A FRAGMENTED APPROACH

What parameters can CAMOS measure?

CAMOS measures currents in module and angle and processes over 20 related parameters with other variables. At the same time, it acts as an electrical protection and integrates a patented fault locator.

CURRENTS

- Phase current
- Screen Current
- Homopolar Currents
- Crossed Ground
- Self-clearing Faults

POWER INTEGRITY

- Harmonic content (THD)
- Oscillograph
- Tan-delta Estimation
- Voltage Correlation
- Frequency Correlation

TEMPERATURE

- Joint and Termination temperature
- Distributed Temperature with DTS
- Anomaly Detection
- Dynamic Cable Rating enhanced with DTS
- Current Correlation

PROTECTION

- 87L differential
- 87S Screen differential
- 50s ground overcurrent
- Faulted Phase identification
- Major/Minor detection

FAULT LOCATION

- Fault Detection and phase ID
- Major Section detection
- Precise Location Calculation
- Third party intrusions with DAS

FEATURES OF CAMOS

Turning cable data into grid Intelligence

Everything you need to evaluate how the technology operates, integrates, and scales in real-world conditions.

Fiber Optic Sensing

Fiber-optic sensors require no power source in the field, eliminating maintenance trips.

Easy Installation

at remote locations, even in underground vaults or hard-to-reach areas.

Low Maintenance

Supports strong multiplexing with many OCTs per interrogator requiring low maintenance

Hybrid Circuit Monitoring

for mixed overhead and underground lines, discriminating fault origins instantly.

Remote Accessibility

Cloud-based interface provides secure remote access to all monitoring data, fault analysis, and alarm management.

Native SCADA Ready

CAMOS feeds data directly into your existing DMS and SCADA systems for a unified control room experience.

SCADA – Supervisory Control and Data Acquisition; DTS – Distributed Temperature Sensing; DAS – Distributed Acoustic Sensing; OCT – Optical Current Transformer

SYSTEM ARCHITECTURE

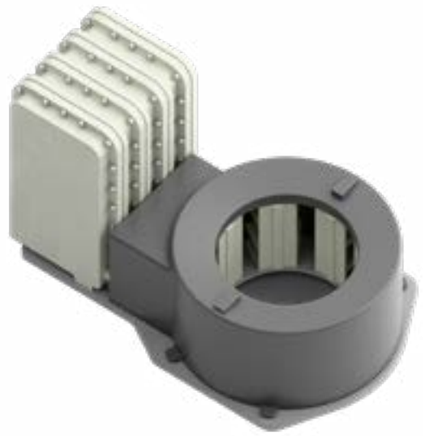
From underground sensing to cloud intelligence

A full-stack system designed for continuous monitoring, diagnostics, and operational decision-making.

01 | OPTICAL CURRENT TRANSFORMERS

Sensing Layer

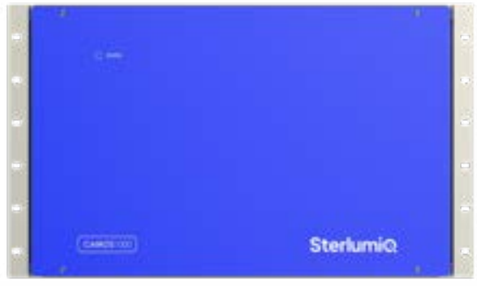
Passive Optical Current Transformers act as critical location sensors, continuously capturing reflected light with variation in its polarization, enabling real-time and continuous measurement of current across the entire cable length, with the ability to integrate other technologies such as FBG and DFOS.



02 | INTERROGATOR

Data Processing Layer

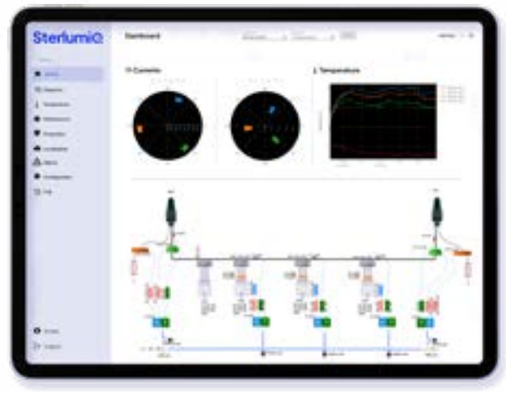
Interrogation units acquire high-frequency optical signals and convert them into structured datasets, applying signal conditioning and synchronization to ensure accurate, continuous, and reliable data capture across long-distance cable networks.



03 | CAMOS INTERFACE AND ANALYTICS

Intelligence Layer

Advanced algorithms interpret processed data to identify patterns, detect anomalies, and localize faults, transforming raw measurements into actionable insights for diagnostics, predictive maintenance, and informed operational decision-making.



TECHNICAL SPECIFICATIONS

Engineered for absolute precision

Everything you need to evaluate how the technology operates, integrates, and scales in real-world conditions.

	PARAMETER	VALUE
SYSTEM	Samples per cycle	160 s/c
	Maintenance oscillos	1 cycle, 288s/c, current phasers A, B, C per maintenance position + all sheath currents + voltage ref
	Protection oscillos	25 cycles (3 prefault), 32s/c, current phases A, B, C per protection position + voltage inputs + all sheath currents + protection bits (pickups and trips) + digital inputs + digital outputs
	Oscillos trigger	Digital inputs (1 for maintenance oscillo trigger and 1 for protection oscillo trigger), communications, scheduled
	Oscillos storage capacity	50 GB
	Oscillos format	ASCII, COMTRADE
OPTICAL CONNECTIONS	Number of connections	2/4/6/8 (according to model)
	Maximum link length	18km. Max length depends on the number of sensors and communication fibers
	Fiber Type	G652D, G657.A2
	Interrogator unit optical connectors	Spliced
	Pigtail optical connectors	FC/APC male
SLED: LIGHT EMITTER	Center wavelength	1550nm
	Power	25dBm
	Optical 3dB bandwidth	40 nm
	Laser classification	Class 1
COMMUNICATIONS	Service port	RS485/ Modbus RTU/ Duplex multimode ST Female connector OM1 62.5/125
	Boot port	RS485/ Modbus RTU/ Duplex multimode ST Female connector OM1 62.5/125
	Modem port	RS485/ Modbus RTU/ Duplex multimode ST Female connector OM1 62.5/125
	Optical Bus Interface	RS485/Modbus RTU/Duplex multimode OM4 50/125 ST Female connector (Optional)
DIGITAL INPUTS	Number/Type	3 no/nc per protection CPU. 4 per emitter (1 internal alarm + 1 external (optical layout) alarm + 2 spare)
	Vnom/Current max.	250Vac/16A Idc, 30A (4s)
	Operating time/Reset time	<8ms/<6ms
	Connector	Phoenix type/5.08 mm
OPTOISOLATED DIGITAL INPUTS	Number	4 per protection CPU | 2 per emitter
	Nominal Voltage	120 Vdc
VOLTAGE INPUTS	Number	3 x emitter + 1x protection CPU
	Vnom	63Vac ± 20%
POWER SUPPLY	Power supply	24 Vdc. 3/4/5 Phoenix type 5.08 x three ways (according to model)
	Power consumption	36W/50W/60W (according to model)
	Connector	Phoenix type 3-pole / 5.08 mm
MECHANICAL DATA	Dimensions	1 rack 19" 6U/8U/10U x 336mm (WxHxD) (height according to model)
	Weight	8/10/12 kg (according to model)
	Material	Aluminium / Stainless steel
	Immunity Tests	Class 4
ENVIRONMENTAL CONDITIONS	Storage temperature	-20°C to +70°C
	Operating temperature	0°C to +50°C
	Humidity (non condensing)	<=95% relative
	Approvals	CE, ISO 9001

COMPARE CAMOS

CAMOS vs the rest

PARAMETERS	CAMOS	DTS + DAS	OTHER OCTS	DES	ROGOWSKI
SENSING AND MEASUREMENT CAPABILITIES					
Passive Sensors	✓	●	✓	●	✗
OCT Unlimited Current Measurement Range	✓	●	●	●	○
Screen Current in Module and Angle	✓	○	✓	●	✗
Phase Current in Module and Angle	✓	✗	✓	●	✗
Screen Current Losses	✓	●	✗	●	○
Harmonic Analysis	✓	●	●	●	○
Processing Speed (288 Samples per Cycle) Current	✓	●	✗	●	○
PROTECTION AND FAULT INTELLIGENCE					
87L Protection	✓	✗	✓	✓	✗
87L - 87S Hybrid Line Synchronisation	✓	✗	●	●	✗
Fault Discrimination and Recloser Automation	✓	✗	✓	●	✗
Fault Pin Pointing	✓	●	✗	✗	✗
Phase in fault identification	✓	✗	✓	●	○
Major Part in fault identification	✓	✗	○	●	○
Minor Part in fault identification	✓	✗	○	✗	✗
Incipient Faults Identification	✓	○	●	●	○
ASSET HEALTH AND PREDICTIVE INSIGHTS					
Circuit Integrity (S.A and Connections)	✓	●	●	●	○
Predictive Ampacity (Dynamic Cable Rating)	✓	✓	✗	✗	✗
Digital Interface with insulation health	●	✗	✗	✗	✗
Digital Interface with transmission capacity	●	✓	✗	○	✗
STANDARDS, COMPLIANCE AND VALIDATION					
IEC Endurance Testing by Third Party	✓	✗	✓	✗	●
IEC Class 1 by Third Party	✓	✗	✓	✗	✓
5PE20 by Third Party	✓	✗	✓	✗	●
COMMUNICATION, INTEGRATION AND SYSTEM ARCHITECTURE					
IEC 61850	✓	✓	✓	✓	✓
IEC 60870-5-104	✓	✓	●	✓	✓
Master - Slave Synchronization of Different Interrogators (10)	✓	●	✗	✗	✗
Light Budget >60DBm / Cable Length (80km)	✓	✓	✗	✗	✗
Third Party Intrusion Detection	✗	✓	✗	✗	✗

DES - Distributed Electrical Sensing DTS - Distributed Temperature Sensing DAS - Distributed Acoustic Sensing OCT - Optical Current Transformer

OUR VISION

Empowering Humanity through Innovation and Intelligent Infrastructure for a Safer Future.

OUR MISSION

To be at the forefront of energy management by leveraging predictive analytics and remote diagnosis, ensuring sustainable and resilient infrastructure for the future of mankind.

ABOUT STERLUMIQ

Sterlumiq is a joint venture between Sterlite Electric and RDT Lumiker, created to redefine how critical cable infrastructure is monitored, managed, and optimized. At its core is CAMOS (Cable Asset Monitoring and Operating System), an advanced fiber-optic sensing and analytics platform that transforms conventional power and telecom cables into intelligent, self-monitoring assets.

By combining critical location current sensing technologies with real-time data processing and predictive analytics, Sterlumiq enables utilities, transmission system operators, renewable energy developers, data centers, and industrial networks to gain continuous visibility into asset performance and network health. This allows for precise fault detection, faster response times, improved capacity utilization, and reduced operational costs.

Sterlumiq addresses one of the industry's most persistent challenges: the lack of real-time insight into underground and critical cable infrastructure. Its solutions empower stakeholders to move from reactive maintenance to proactive, data-driven decision-making—enhancing reliability, extending asset life, and supporting the transition to more resilient and efficient energy systems.

With a focus on digitalization, sustainability, and operational excellence, Sterlumiq is building the foundation for smarter, more transparent infrastructure networks worldwide.

WHY CHOOSE STERLUMIQ

Experience

Decades of asset monitoring solutions for critical infrastructure, delivering measurable uptime, reduced faults, and operational clarity in the world's most demanding environments.

Expertise

Deep domain knowledge in fiber optics, OCT sensing, and power systems, translating complex physics into reliable, field-ready monitoring that utilities can trust every day.

Innovation

Proprietary CAMOS platform combining real-time sensing, advanced analytics, and cloud intelligence to move from reactive maintenance to predictive, data-driven asset performance.

Global Presence

Deployed across regions, climates, and grid conditions, with local support and global standards ensuring consistent performance, faster response, and scalable rollouts worldwide.

Sterlumiq

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