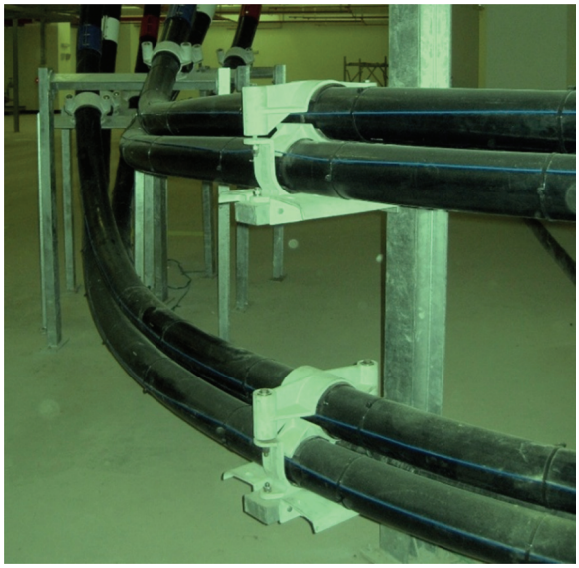
Fibre Optic Distributed Temperature Sensing for Energy Transmission and Distribution Systems



EN.SURE®
Real Time Condition Monitoring for Electrical Transmission & Distribution Systems

A continuous and cost-effective monitoring solution of the electric power transmission and distribution grid is the key factor for a successful Smart Grid implementation.
Based upon raising load demands, Utilities need to be able to maximize the performance of the power cable systems safely and efficiently. Then, it is critical for the operators to understand what the thermal behaviours of the cable system and its environment are.
During high-load and emergency conditions, it must be ensured that maximum emergency temperatures are not exceeded.
LIOS EN.SURE is based on state of the art distributed temperature sensing (DTS) monitoring systems customised for the electrical T&D industry. One single EN.SURE evaluation unit provides fast temperature sensing profiles with high spatial resolution along the optical fibres route with monitoring ranges up to 40km per channel.

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Technical Highlights

- Highly reliable industrial design with key components approved by the telecom industry (tested according to Telecordia standard GR-468, with medium lifetime >25 years)
- Signal processing based on patented Raman OFDR-Technology (Optical Frequency Domain Reflectometry)
- Superior hotspot detection along the whole sensor cable length even at most remote distances based on the invariant OFDR spatial resolution
- Flexible and direct connection to management systems such as SCADA and real time thermal rating (RTTR) software calculation engines based on IEC, AEIC and IEEE standards
- Up to 16 internal fibre optic channels – 1 EN.SURE DTS unit can cover the most complex power cable circuits
- Temperature resolution better than 1 °C
- Laser product class 1M according to DIN EN 60825-1: 2007
- Maintenance free and simplified outdoor installation capability through higher allowed operating temperature range and fan-free DTS unit design – MTBF more than 30 years
- Impressive track record with more than 3500 permanent units installed worldwide

EN.SURE

LIOS TECHNOLOGY

EN.SURE DTS models – Distributed Temperature Sensing	
EN.SURE20, EN.SURE40, EN.SURE60, EN.SURE80	Monitoring ranges 2 km, 4 km, 6 km, 8 km (per channel)
EN.SURE100, EN.SURE120, EN.SURE140	Monitoring ranges 10 km, 12 km, 14 km (per channel)
EN.SURE160, EN.SURE180, EN.SURE200, EN.SURE300	Monitoring ranges 16 km, 18 km, 20 km, 30 km (per ch.)
EN.SURE200SM, EN.SURE300SM, EN.SURE400SM	Monitoring ranges 20 km, 30 km, 40 km (per channel)
Internal optical channels	1, 2, 3, 4, 6, 8, 9, 12, 16 (options)
Spatial resolution	1 m
Communication / SCADA interfaces	
Programmable inputs	4 (optional up to 40)
Programmable outputs (potential-free)	10 (optional up to 106)
Analogue outputs	4 – 20mA (external, optional)
Communication interfaces	Ethernet TCP/IP (2x) , RS232, USB
Communication protocols	MODBUS, DNP3, IEC60870, IEC61850 (options)
External sensor inputs	Pt100(2x),Current0-20mA(2x),Voltage0-10V(2x)(option)
Mechanical data	
Controller	19" Rack / 3 rack height units
Dimensions (H x W x D)	13.1 x 48.3 x 33.8 cm
Weight	13kg
Electrical data	
Operating voltage (DC Controller)	DC nom. 12 ... 48 V (max. 10 ... 60 V DC)
Mains voltage (AC Controller)	AC 100 ... 240 V or DC 110... 220 V
Power consumption (DC Controller)	<25W (max. 45 W/60°C)
Optical data	
Optical connector	E2000 / APC
Laser classification	Class 1M (EN60825-1: 2007)
Fibre type, multimode – ranges 2 ... 20 km	Gradient index 50/125 µm multimode
Fibre type, singlemode – ranges 20 ... 40 km	SM 9/125 µm singlemode
Environmental conditions	
Storage temperature	-35 ... +75 °C
Operating temperature	-10 ... +60 °C
Humidity (non condensing)	≤95 % rel.
Protection class (IEC 60529)	IP51
Type tests	
TÜV Rheinland (Germany) and VdS Schadenverhütung GmbH (Germany) as far as required	Electrical safety IEC/UL 61010-1, IEC 61140 EMC EN61326-1, EN61000-6-2,3,-4-2,3,4,5,6,8,11 -3-2,3, EN 50130-4, EN 55011, FCC 47 CFR Ch.1 Part15, Environmental testing IEC 60068-2-6,14,27,30,64, RoHS directive 2002/95/EC, WEEE directive 2002/96/EC, Low voltage directive 2006/95/EC

TÜVRheinland DE 2-015165 · VdS •ISO 9001 •approved products · Deloitte Cert Umweltgutachter GmbH certified DIN EN ISO 14001 Registration No. Z1084

Ensure Save and Stable Grid Operation

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