

LIOS PRE.VENT

INDUSTRIAL TEMPERATURE MONITORING

Fibre Optic Distributed Temperature Sensing



LIOS DTS Technology for

- **Reactor & Process Engineering**
- **Pipeline Monitoring**
- **Environmental Monitoring**

The LIOS temperature monitoring solutions are based on using passive optical fibres as distributed temperature sensors.

- Highly reliable industrial design with key components approved by the telecom industry (tested according to Telecordia standard GR-468).
- Excellent Mean-time-between-failures (MTBF) rating of more than 30 years.
- Signal processing based on patented Raman OFDR Technology (Optical Frequency Domain Reflectometry)

- Up to 16 internal fibre optic channels, available single ended or in loop setup (redundancy concept)
- High spatial resolution <1m
- Minimum Temperature resolution
- Laser product class 1M according to IEC / EN 60825-1
- Flexible and direct connection to management systems such as SCADA
- Maintenance free and low power consumption DTS for simplified outdoor installation capability
- Fan-free DTS unit design with passive cooling, no moving parts and higher allowed operating temperature range
- Superior environmental stability over full operating temperature range
- Easy commissioning and self-diagnostics
- Unique experience and impressive track record with more than 4500 permanent units deployed worldwide

PRE.VENT DTS models – Distributed Temperature Sensing

OTS3 – 20, 40, 60, 80	Monitoring ranges 2 km, 4 km, 6 km, 8 km (per channel)
OTS3 – 100, 120, 140, 160	Monitoring ranges 10 km, 12 km, 14 km (per channel)
OTS – 180, 200, 250, 300	Monitoring ranges 16 km, 18 km, 20 km (per channel)
OTS – 250, 300, 400	Monitoring ranges 20 km, 30 km, 40 km (per channel)
Internal optical channels	1, 2, 3, 4, 6, 8, 9, 12, 16 (options, available single ended or loop setup)
Sampling Interval	2 m, 1 m, 0.5 m, 0.25 m

Communication / SCADA interfaces

Programmable inputs	4 (optional up to 40)
Programmable outputs (potential-free)	10 (optional up to 106)
Communication interfaces	Ethernet (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 or optionally 62.5/125 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

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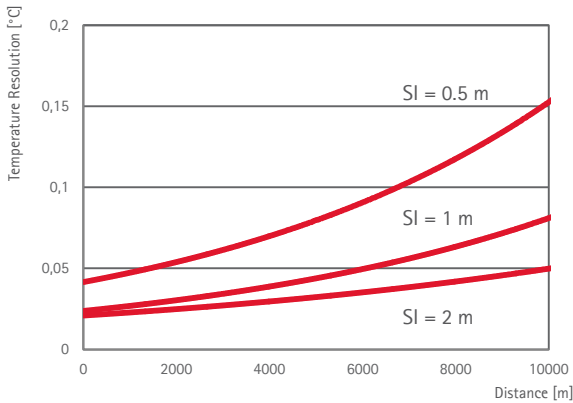
Compliance

Electrical safety	IEC/UL 61010-1, IEC 61140 Low voltage directive 2006/95/EC
EMC	EN 61326-1, EN 50130-4, EN 55011 EN 61000-6-2,3,-4-2,3,4,5,6,8,11-3-2,3 FCC 47 CFR Ch.1 part 15
Laser safety	EN 60825-1,-2
Explosion safety (option)	IEGEx-Scheme, ATEX – Directive, EN/IEG 60079-0,-28
Environmental testing	IEC 60068-2-6,14,27,30,64, NAVMAT P-9492, ISO 13628-6 MIL-STD-810F, FED-STD-101C
Environmental compliance	RoHS directive 2002/95/EC, WEEE directive 2002/96/EC

PRE.VENT DTS capabilities – Temperature resolution

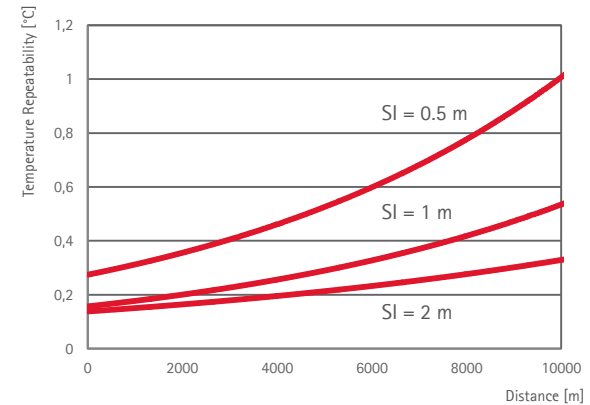
For 10 min cycle time and 75 °C fibre temperature, example data

Multi mode DTS controller

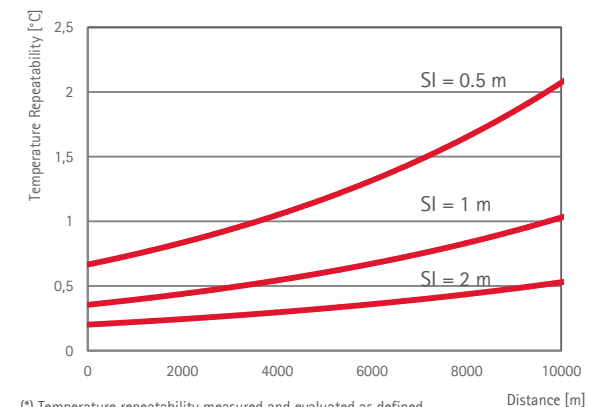
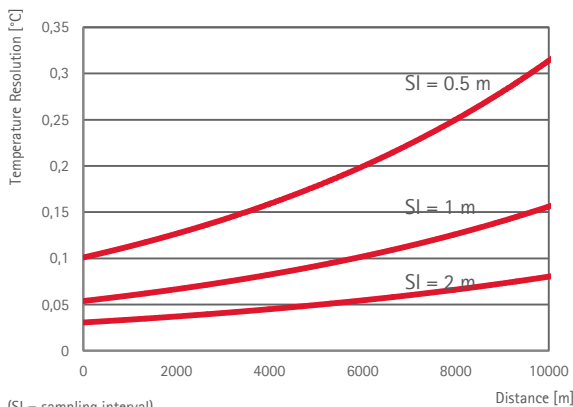


Temperature repeatability

For 10 min cycle time and 75°C fibre temperature (*)



Single mode DTS controller



(SI = sampling interval)

(*) Temperature repeatability measured and evaluated as defined in SEAFOM recommendation MSP_1



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