

LIOS WELL.DONE

DISTRIBUTED TEMPERATURE MONITORING

Distributed Temperature Monitoring of Upstream Applications in the Oil & Gas Industry



WELL.DONE®

Ensuring a reliable and profitable operation of your assets

The WELL.DONE system is the most reliable distributed temperature sensing (DTS) system on the market used for temperature sensing and logging applications in complex and simple wells. The fiber optic downhole sensor cable allows measurements at high temperatures and in combination with the WELL.DONE single mode fiber the system is even insensitive to hydrogen based darkening effects. Especially the robust and maintenance free design in combination with its ability to provide open standard protocols makes the WELL.DONE solution flexible, efficient and cost saving.

- Highly reliable industrial design with key components approved by the telecom industry (tested according to Telecordia standard GR-468, with service life of >25 years)
- Signal processing based on patented Raman OFDR Technology (Optical Frequency Domain Reflectometry)
- Up to 16 internal fiber optic channels
- Temperature resolution better than 0.08 °C (1 meter sampling interval, see plots)
- Laser product class 1M according to DIN IEC / EN 60825-1
- Maintenance free and simplified outdoor installation capability through higher allowed operating temperature range
- Fan-free DTS unit design with passive cooling; no moving parts
- Superior environmental stability over full operating temperature range
- Easy commissioning and self-diagnostics
- Double ended calibration performed by DTS unit
- Remote configuration and operation via TCP/IP
- Internal storage 2 to 16 GB flash memory
- Impressive track record with more than 4500 permanent units installed worldwide

WELL.DONE DTS models – Distributed Temperature Sensing – single mode (SM) or multi mode (MM)

Distance range (per channel)	SM: 5, 10, 15, 20, 25, 30 km MM: 2, 4, 6, 8, 10, 12, 16, 20, 25, 30 km
Internal optical channels	1, 2, 4, 6, 8, 12, 16 (options)
Resolution	See plots compliant to SEAMFOM MSP_01 below
Sampling interval (SI)	1 m (3.3 ft), 0.25 m (0.82 ft) (option)
Minimum measurement time	5 sec

Communication

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, XML (PRODDL/WITSML, LAS or OPC on request)

Mechanical data

Controller	19" Rack / 3 rack height units
Dimensions (H x W x D)	13.1 x 48.3 x 33.8 cm (5.16 x 19.02 x 13.01 inch)
Weight	13kg (29 lbs)

Electrical data

Operating voltage (DC Controller)	DC 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 at 60°C / 140 F)

Optical data

Optical connector	E2000 / APC
Laser classification	1M
Fibre type – multi mode DTS controller	Gradient index 50/125 µm multi mode
Fibre type – single mode DTS controller	9/125 µm

Environmental conditions

Storage temperature	-35 ... +75 °C (-31 ... 167 F)
Operating temperature	-10 ... +60 °C (14 ... 140 F)
Humidity	5 to 95 % rel. (non condensing)
Protection class (IEC 60529)	IP51

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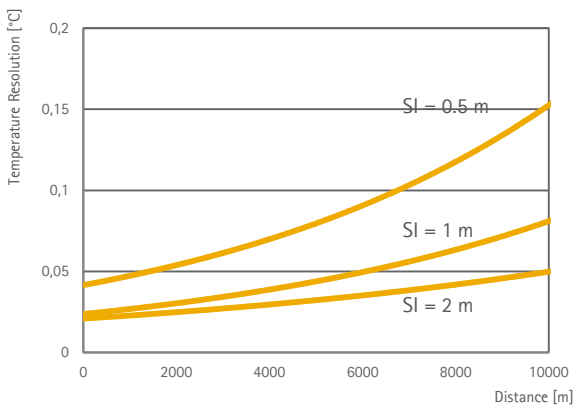


Compliance

Electrical safety	IEC/UL 61010-1, IEC 61140 Low voltage directive
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)	Directive ATEX, EN 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 WEEE directive

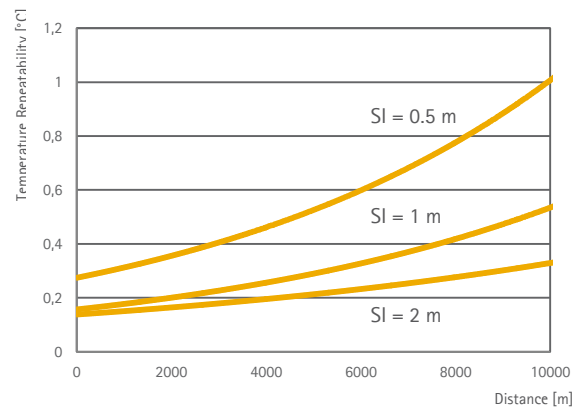
WELL.DONE DTS capabilities – Temperature resolution

For 10 min cycle time and 75 °C fiber temperature
10 averages, 1 sigma
Multi mode DTS controller

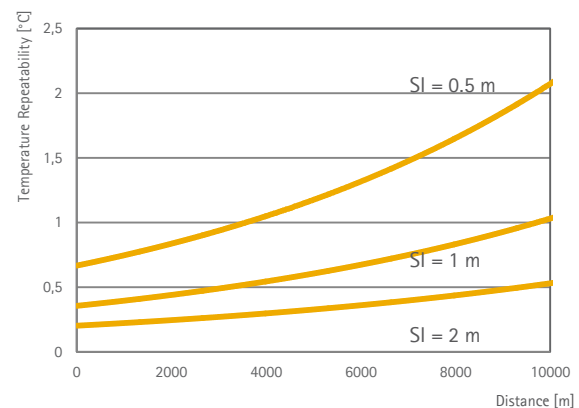
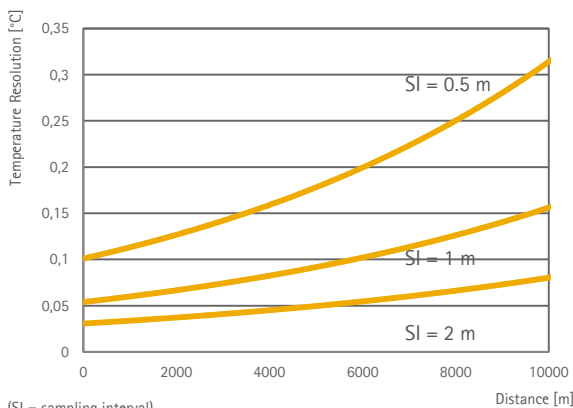


Temperature repeatability

Measured and evaluated as defined in SEAFOM recommendation MSP_1,
for 10 min cycle time and 75°C fiber temperature



Single mode DTS controller



(SI = sampling interval)



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