Reduced HSSE issues and costs through real-time well integrity monitoring
Production optimisation through real-time offtake management
Frac treatment monitoring of unconventional reserves
Real-time data for reservoir modelling
Real-time troubleshooting of reservoir issues

COST EFFECTIVE, SINGLE POINT OR MULTI-DROP DOWNHOLE PRESSURE AND TEMPERATURE MONITORING

Distributed permanent downhole pressure and temperature gauges
Multiple gauges integrated on a single ¼” control line
Factory made gauge array cable delivered to rig site for quick and easy installation
Rugged surface instrumentation delivers real-time “data to desk” advantage
Downhole electronics eliminated
10 year deployment history with 98% reliability
Able to integrate other optical systems such as DTS and DAS for a full monitoring package
Low CapEx investment and no routine maintenance costs
High return on investment via various data value cases:

www.smartfibres.com/dpts
DPTS TECHNOLOGY

Smart Fibres’ Distributed Pressure and Temperature Sensing (DPTS) is based on a fiberoptic sensor called the fibre Bragg grating (FBG) which responds to strain and temperature. More information is available at smartfibres.com/technology. For DPTS, we use the strain response to measure fluid pressure via a diaphragm transducer called SmartPort, a permanent downhole gauge (PDHG). Multiple SmartPorts are connected on a ¼” control line and send pressure / temperature data to a surface readout unit called an interrogator.

DPTS TECHNOLOGY BENEFITS

Why use fiberoptic for permanent downhole measurements?

- Fiberoptic technology is immune to EMI, allowing operation near noisy electrical apparatus such as ESPs.
- Downhole electronics eliminated, enabling measurement for the life of the completion.
- Fiberoptic downhole equipment is small in size and easy to deploy.

Why choose to measure pressure?

- It is the most important downhole measurand and flow can be directly calculated from pressure with high confidence, so giving direct production data. These data can be used not only to ensure production but also to optimise it.

Why choose FBG technology to measure pressure?

- High resolution FBG data provide instant, actionable information without the need for averaging or post-processing.
- Data are frequency encoded, so attenuation due to fibre or connector degradation would not impact measurement.
- It allows many PT gauges to be multiplexed on a single cable, lowering deployment complexity, cost and risk.

Why choose Smart Fibres’ DPTS technology?

- Our low cost opens DPTS to assets where even a single point measurement was previously too expensive.
- Our deployment string has gauges pre-assembled at factory, so is easy to deploy and reduces rig cost.
- We can integrate partners’ DTS and DAS onto our fibre, allowing a complete integrated monitoring capability.

SMART FIBRES’ DPTS TRACK RECORD (until April 2018)

- First deployment: 2008
- DPTS Systems deployed: 19
- Gauges deployed: 104
- Reliability of latest gauge: >98%
- Places deployed: Middle East, West Africa, North America, Asia Pacific

THE DATA YOU NEED

DPTS data are delivered real-time to the Operator’s desk

A DPTS Instrumented Oil Well, Oman

www.smartfibres.com/dpts
EXAMPLE DPTS TECHNOLOGY USE CASES

IMPROVED RESERVOIR MODELLING
Having multiple PT readings across the reservoir allows engineers to better understand and model reservoir behaviour, which aids improved production efficiency and field development planning.

BETTER OFFTAKE MANAGEMENT
DPTS data can be used as part of an intelligent wells production methodology, where the downhole data enables informed operator control decisions. Such control decisions can involve downhole tools such as ESPs, ICD or SSD inflow devices, or surface actions such as when to inject or produce, all intended to ensure optimal recovery.

STACKED RESERVOIR PRODUCTION
In stacked reservoirs where a producer passes through multiple pay zones, DPTS can monitor the relative contribution of each stack to help manage offtake.

FRAC WELL OPTIMISATION
DPTS in the treatment well can provide accurate bottom hole pressure for model calibration. From an offset wellbore, DPTS can identify frac hits and well communication.

FLUID CONTACT MONITORING
DPTS data can provide real-time fluid levels in wells, which is used for oil rim monitoring in highly fractured reservoirs, and level monitoring in storage caverns.

IMPROVED TROUBLESHOOTING
When things do not go to plan, DPTS data can provide asset managers with invaluable insight to support their troubleshooting and remedial action processes.

DPTS SYSTEM PERFORMANCE
- Pressure range: 1, 1.5, 5, 10, 20 kpsi
  70, 100, 350, 700, 1400 bar
- Pressure accuracy: < 0.1% of full scale
- Pressure resolution: < 0.005% of full scale
- Pressure stability: < 0.1% of full scale per year
- Multiplexing: 15 gauges per fibre pair
- Temperature range: -20 to 150 deg C
  0 to 300 deg F
- Temperature accuracy: 0.1 deg C
  0.2 deg F
- Temperature resolution: 0.002 deg C
  0.004 deg F

DPTS SYSTEM COMPONENTS

SmartPort P/T Gauge
www.smartfibres.com/products/smartport
An optical permanent downhole gauge using FBG technology.

SmartMandrel
www.smartfibres.com/products/smartmandrel
A SmartPort gauge carrier that allows tubing pressure measurements.

SmartSplit
www.smartfibres.com/products/smartsplit
A housing for making downhole spliced connections.

SmartPB Pressure Barrier
www.smartfibres.com/products/smartpb
A backup surface pressure barrier to ensure well integrity.

Downhole Cable
A fibre in metal tube optical cable suited to well deployment.

Wellhead SmartScope
www.smartfibres.com/products/wellhead-smartscope
A surface readout unit for transferring gauge data into client systems.


www.smartfibres.com/dpts