



PERMANENT MONITORING SYSTEMS

SPSRO™ Permanent Monitoring

Spartek Systems specializes in providing the oil and gas industry with high quality data to monitor well performance and diagnose potential problems. Spartek Systems can provide cost effective solutions for your Real Time Permanent Monitoring needs.

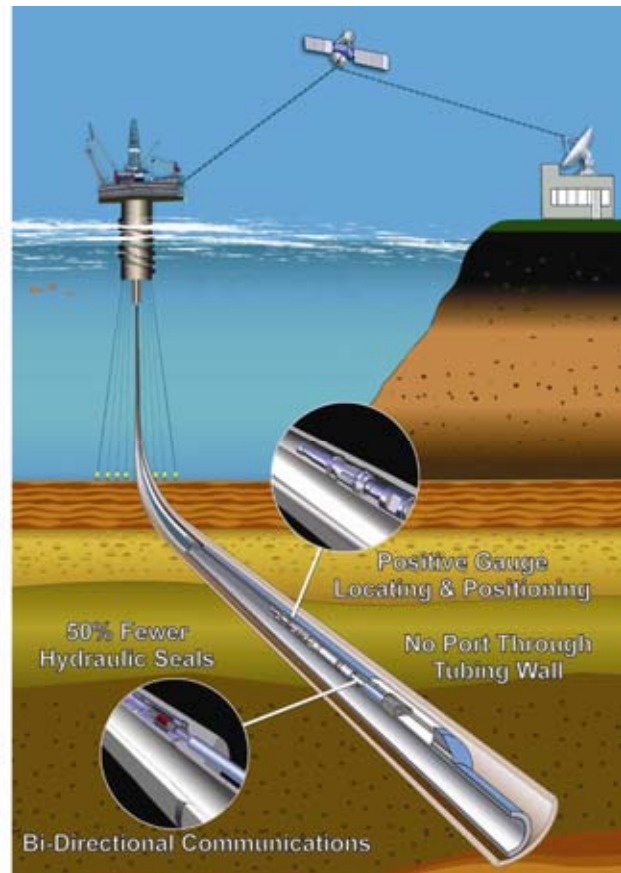
Product Overview

Permanent downhole measurement technology is a common component of conventional well completions. Our system consists of one or more downhole sensors used to measure, record, and transmit pressure and temperature data to determine reservoir performance. A conventional system includes a quartz pressure sensor mounted externally onto a port in the tubing wall, for measurement of tubing pressure and annulus temperature. A tubing encapsulated conductor (TEC), is attached to the gauge from the surface, and strapped to the tubing, which powers the gauge and transmits data back to the surface. A surface acquisition unit capable of receiving, storing and forwarding the acquired data completes the system.

The conventional technology gauge carrier has a hydraulic connection through the tubing wall to the externally mounted gauge, with an additional hydraulic connection, connecting the gauge to the TEC from the surface.

Spartek's patented Side Pocket Surface Readout (SPSRO™) system replaces the conventional system's carrier and offers several exclusive advantages.

- ▶ The downhole instrumentation is wireline retrievable. Minimizes cost associated with recalibration or replacement of the pressure gauge.
- ▶ The gauge is immersed in the produced fluid, measuring tubing pressure and tubing temperature from its position in an off-center side pocket.
- ▶ There is no port (or hole) through the tubing wall. Eliminates potential of hydraulic seal failure between tubing and annulus.
- ▶ Testable metal to metal seal is used to connect the TEC to the Inductive Coupler.
- ▶ The inductive coupler is used to power the gauge and provide bi-direction digital communications. The inductive couple has no exposed electrodes or elastomers and is insensitive to wellbore fluids.
- ▶ Surface Data Acquisition unit is capable of acquiring data from multiple gauges on a single TEC.
 - ◆ Sample rate controlled from the surface.
 - ◆ 2 Gbytes memory for data storage.
 - ◆ Optionally powered by solar or wind.



SPSRO™
Side Pocket Surface Read-Out
Permanent Downhole Monitoring

SPARTEK SYSTEMS

Providing Our Customers With "Best In Class" Technology

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<http://www.sparteksystems.com>

Specifications:

Downhole Gauge System						
Gauge			Cable			
Gauge Type	SPSRO Quartz		Size	0.25 inch OD		
Diameter (OD)	1.27 inches			0.028 inch wall		
Length	19 inches			16 AWG		
Material	Inconel 718 - NACE			Solid Copper		
Seal Configuration	No Seals, Fully Welded		Encapsulation	As required		
Power Consumption	30 Vpp @ 5 mA		Material	A825 Inconel or 316 SS		
Retrievable	YES (wireline)					
Sample Rate	1 sample / sec (max)					
Pressure			Temperature			
Sensor Type	Quartz		Calibrated Range	25°C-177°C (77°F-350°F)		
Pressure Ranges	10k, 16k, 20k psi		Accuracy	0.25°C (0.45°F)		
Accuracy	0.02% Full-Scale		Resolution	<0.005°C (<0.009°F)		
Resolution	0.00006% Full-Scale					
Drift	< 0.02% FS / year					
Surface Acquisition Systems						
Indoor/Outdoor All Weather			Rack Mount			
Channels	4		Channels	4		
Sample Rate	4 sample/sec (max)		Sample Rate	4 sample/sec (max)		
	Configurable			Configurable		
Operating	-40°C to 65°C		Operating	-40°C to 65°C		
Memory	2 Giga Bytes Storage		Memory	2 Giga Bytes Storage		
	Non Volatile			Non Volatile		
Communication	USB, RS485, Modbus		Communication	USB, RS485, Modbus		
Software	Windows Vista/XP/NT/2000		Software	Windows Vista/XP/NT/2000		
Size (W x H X D)	8 x 10 x 6 inches		Size (W x H X D)	19 x 1.75 x 12 inches		
Weight	6.9 lbs		Weight	13 lbs		
Mounting	Pole or Wall Mount		Mounting	19 inch standard 1u rack mountable		
Power	24 VDC @ .5 A		Power	110/240 AC @ 100 mA		
	Wind or Solar (optional)					
Desert Application	YES					
Area	Class 1, Div 2 Group B, C, D					
Ingress Protection	NEMA 4X Rating					
Relative Humidity	0 to 95%					
SPSRO Mandrel						
Tubing Size (inches)	Mandel OD (inches)	Mandrel ID (inches)	Drift ID (inches)	Burst (psi)	Collapse (psi)	Material
2.375	4.550	1.995	1.901	10,600	9,800	Available: 13 Cr L80 (80k psi yield) 4130 L80 (80k psi yield)
2.875	4.950	2.441	2.347	9,800	8,800	
3.500	5.500	2.921	2.797	8,700	7,000	
4.500	7.000	3.958	3.833	10,000	8,900	
5.500	8.000	4.892	4.767	7,700	5,500	

Specifications subject to change without notice

For More Information, Pricing, and Technical Support Contact:



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