



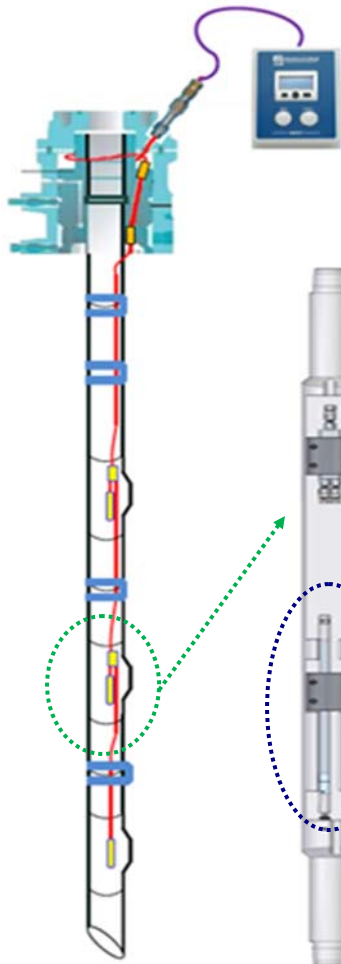
# PERMANENT MONITORING SYSTEMS SAPPHIRE MULTI-DROP

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

Spartek Systems' Sapphire Multi-Drop system can be configured for up to 16 gauges on one TEC, allowing coverage of complex multi-zone wells, with extra capacity to allow for the addition of back-up gauges for system redundancy.

All accessories required for a complete system install are available: this includes a range of Tubing Encapsulated Cables, CCCP Cable Clamps, Wellhead Outlets, Gauge Mandrels, Armored Surface Cable and TEC Connectors, Splices and Splitters as required.



The surface acquisition unit (SAU) provides power and acts as a memory for down-hole gauges in permanent completions as well as providing the communications hub for SCADA or real-time transmission. The SAU links to the gauges downhole through the Tubing Encapsulated Cable (TEC) and the Well-Head Outlet (WHO). The SAU can be powered using rig power, solar or wind turbine type power supplies. The SAU can also be used to program and interrogate the downhole Permanent Pressure Gauges.

The "Full Body" Gauge Mandrel features an internal porting design allowing individual gauges to be ported to annulus or tubing as desired; materials rated for any sweet or sour down-hole environment and a burst /collapse pressure rating that meets or exceeds that of the tubing string. Single Gauge, Dual Gauge and By-Pass Gauge Mandrels are available in 4130 L80 or Cr13 L80, with either Vam Top or EUE threads.

Spartek Systems Permanent Sapphire Pressure Gauge uses proprietary piezo-resistive technology to digitize pressure and temperature data downhole and then transmit to the surface using a high-speed digital telemetry link. Along with a fully welded corrosive-resistant alloy (based on material selection) design and redundant pressure testable metal-to-metal cable head, the Permanent Sapphire Pressure Gauge is ideally suited for long term data quality and reliability

Gauges connect to the Carrier using a Pressure Testable AUTO-CLAVE metal-to-metal seal connection.

The TEC cable connects to the gauge using a choice of "cable-heads" –sweet or sour, 1/4" or 1/8" – in addition, a range of pressure testable cable-heads are available when using 1/4" TEC cable.

Detailed specifications for our Sapphire Multi-Drop Gauges, TEC Cables and our range for Full Body Gauge Mandrels are details in the table below. These represent our "standard" range for this product offering. Where this might not meet you specific needs we are able to design a bespoke solution for you on an "as built" basis.

**Providing Our Customers With "Best In Class" Technology**

Email: [sales@sparteksystems.com](mailto:sales@sparteksystems.com)

<http://www.sparteksystems.com>

Specifications:

Downhole Gauge System						
<b>Gauge</b>			<b>Cable</b>			
Gauge Type	MD Sapphire		Size	0.25 inch OD		
Diameter (OD)	0.75 inches		Wall Thickness	0.028 or 0.035 inch wall		
Length	17" inches		Conductor	16 AWG Stranded Copper		
Material	17-4PH or Inconel 718 - NACE		TEC Material	A825 or 316L		
Sample Rate	1 sample / sec (max)		Encapsulation	As required		
<b>Pressure</b>			<b>Temperature</b>			
Sensor Type	Sapphire		Calibrated Range	25°C-125°C (77°F-257°F)		
Pressure Ranges	750, 1500, 3k, 6k, 10k, 15k, psi		Max	170°C (338°F)		
Accuracy	0.02% Full-Scale		Accuracy	1.0°C		
Resolution	0.0003% Full-Scale		Resolution	<0.005°C		
Drift	< 0.03% FS / year					
Surface Acquisition Systems						
<b>Indoor/Outdoor All Weather</b>			<b>Rack Mount</b>			
Operating Temp	-40°C to 60°C (-40°F to 140°F)		Available on a build to order basis,			
Channels	Up to 16 Gauges		Size (W x H X D)	19 x 1.75 x 12 inches		
Sample Rate	1 sample/sec for system		Weight	13 lbs.		
Memory	2 Giga Bytes Storage		Mounting	19 inch standard 1u rack mountable		
	Non Volatile		Power	110/240 AC @ 100 mA		
Communication	USB, RS485, Modbus					
Software	Windows 10/8/7/Vista/XP/NT/2000					
Size (W x H X D)	8 x 10 x 6 inches					
Weight	7 lbs.					
Mounting	Pole or Wall Mount					
Power	24 VDC, 12W (Wind/ Solar option)					
Display	4 x 20 VFD, 3 button menu					
Desert Application	YES					
Area	Class 1, Div 2 Group B, C, D					
Ingress Protection	NEMA 4X Rating					
Relative Humidity	0 to 95%					
Gauge Mandrel						
Tubing Size (inches)	Mandel OD (inches)	Mandrel ID (inches)	Drift ID (inches)	Weight (lbs/ft)	Thread	Material Bursts & Collapse
2.375	3.875	1.953	1.901	4.6	Vam top	<u>Available Material:</u> 13 Cr L80 (80k psi yield) 4130 L80 (80k psi yield) Other materials available on a build to order basis. <u>Burst &amp; Collapse:</u> meets or exceeds the rating of the tubing string
2.875	4.375	2.406	2.347	6.4	"	
3.500	5.125	2.938	2.867	9.2	"	
4.500	6.500	3.938	3.833	11.6	"	
2.375	4.000	1.953	1.901	4.7	EUE	
2.875	4.688	2.406	2.347	6.5	"	
3.500	5.438	2.938	2.867	9.3	"	
4.500	6.562	3.938	3.833	12.75	"	

Specifications subject to change without notice

For More Information, Pricing, and Technical Support Contact:



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