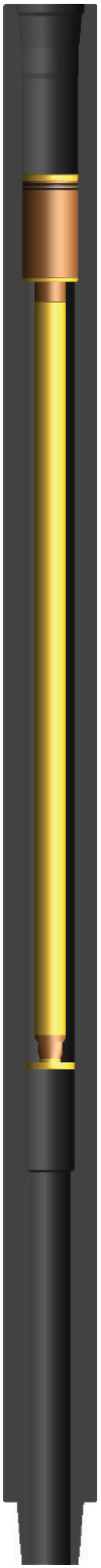

Wildfire Angle & Azimuth Survey Tool

Wildfire is a real-time MWD survey tool designed to provide unmanned monitoring of wellbore deviation and direction. It provides an intermediate solution between time consuming and inaccurate wireline survey tools and expensive steerable MWD systems.

Built around a proprietary mud pulser, high shock rated solid state sensors and rugged control electronics, the Wildfire MWD Survey Tool provides a robust and cost effective surveying option for vertical wellbores. It dramatically reduces survey times when compared to wireline or memory survey tools and maximizes usable rig time in drilling operations.

The Wildfire MWD Survey Tool implements a high torque, high wear rotary shear valve and provides increased reliability and durability in contaminated mud systems. It also has significantly superior tolerance to LCM and solids when compared to conventional pulser designs that utilize small screens and inlets which are susceptible to blockages.

Unlike other currently available survey tools which only transmit wellbore inclination and azimuth to the surface, the Wildfire MWD Survey Tool also provides Total Gravity Field, Total Magnetic Field and Dip Angle values, drastically reducing the risk of bad surveys. System health parameters such as downhole tool temperature and tool battery life are also transmitted. Surveys are initiated by simply cycling the mud pumps off and on. The total survey time is less than 3 minutes.

Data telemetered from the downhole tool is decoded and displayed automatically by the Wildfire Surface System. The Wildfire Surface System has a small footprint and integrates easily into the crowded workplace in the dog house. It is touchscreen enabled and features an easy to use interface that can be mastered in minutes. The driller can view real-time graphs of pressure data and filtered pulse data, and can also visualize the wellbore using Vertical Section and Horizontal Section plots and view the entire wellbore in a fully animated 3D interface.

The Wildfire Surface System has extensive data logging and report generation capabilities. Survey reports can be exported using the built in USB port in PDF and CSV formats.

The Wildfire MWD Survey System is logistically friendly and ships ready to run in a 12 ft non-magnetic high strength stainless steel drill collar. The entire system can be installed, initialized and operational in less than 30 minutes.

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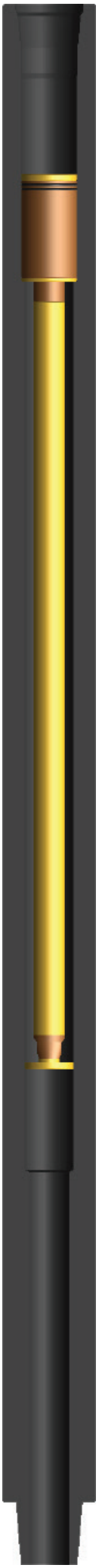
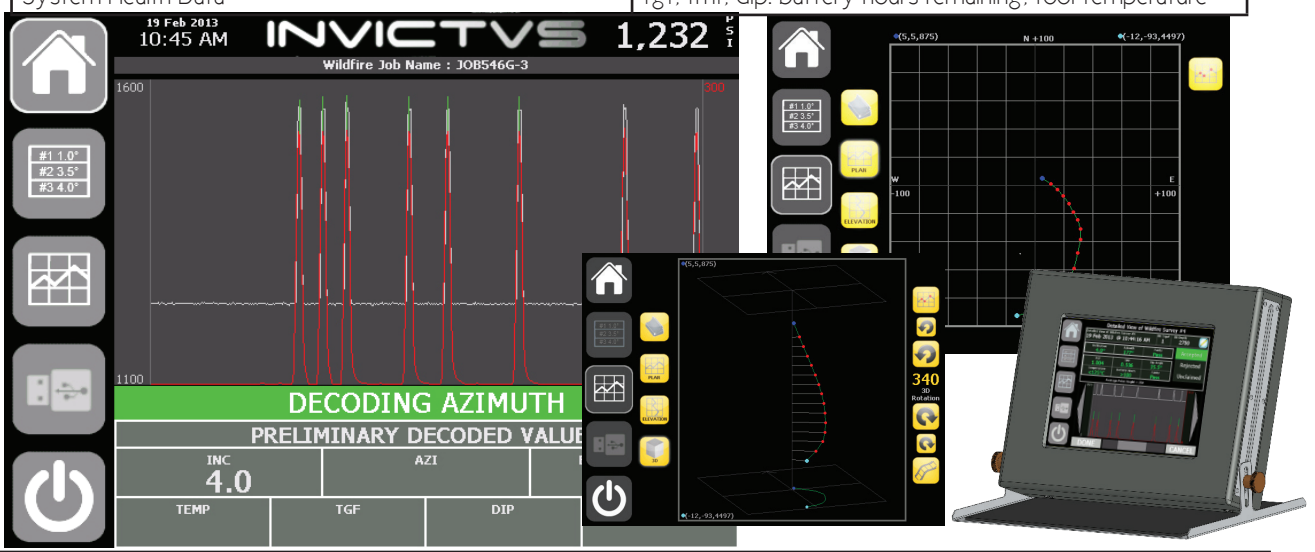


Wildfire Angle & Azimuth Survey Tool

Specifications	rev. 04.17.2019
Data Transmission Type	positive mud pulse
Available Tool Sizes/ Operating Flow Rate	4.75" (121mm) with 3 ½" IF, 150-350gpm 6.50" (165mm) with 4 ½" XH, 250-600gpm 8.00" (203mm) with 6 ⅝" Reg, 400-750gpm 9.50" (241mm) with 7 ⅝" Reg, 600-1200gpm
Nominal Length	12 ft
Power Supply	lithium thionyl-chloride high temperature batteries
Shock Limit / Vibration Limit	1000g, 0.5ms / 20G RMS random 50-500Hz
Operating Temperature	32 ° to 302 ° F
Survival Temperature	-40 ° to 329 ° F
Hydrostatic Pressure (max)	15,000psi
Pressure Drop	~50psi @ 350 gpm water
LCM Tolerance (max)	60-80 ppb medium nut plug, premixed
Sand Content	<5%, <2% optimal
Inclination Sensor Accuracy / Repeatability	± 0.2 ° / ± 0.05 °
Azimuth Sensor Accuracy / Repeatability	±1.5° (>5° Inclination) / ±0.5°
Data Telemetered	
Survey Procedure	pumps off for 60 seconds, pumps on for 3 minutes
Angle Range/ Resolution	0°- 102.3° / 0.1 °
Azimuth Range/ Resolution	0°- 359° / 1°
System Health Data	tgf, tmf, dip. battery hours remaining, tool temperature



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