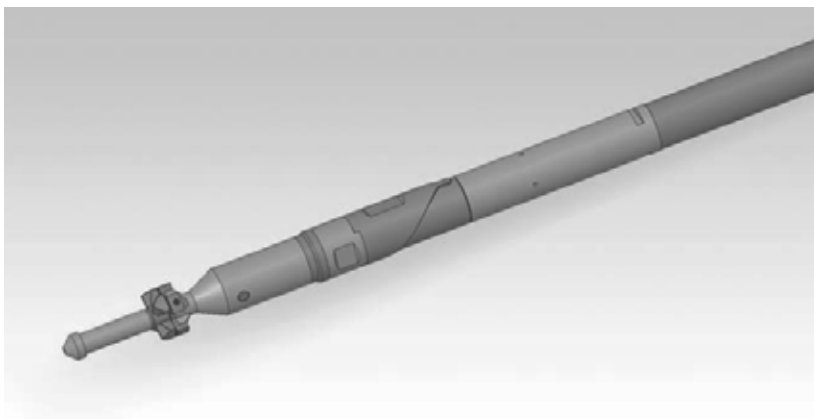




I-PULSE (Rotary) – Top Landing Pulser

I-PULSE is the latest rotary style Pulser utilizing DC brush less technology to provide extended battery life with a direct drive impeller creating the mud pulse signal, LCM (lost circulation material) and solids have very little effect on the operation of this Pulser. Easily handles LCM up to 75 lbm/bbl of medium nut plug or cedar fiber. I-PULSE is fully compensated so drilling deeper uses the same amount of battery power as drilling shallow wells. I-PULSE is a fixed mounted Pulser; with a retrievable option to reduce lost in-hole charges. Pulse amplitudes can be configured easily in the field to accommodate for changing drilling environments. Data rates of up to 3 bits per second can be realized with an impeller style Pulser. I-PULSE can be upgraded to incorporate annular pressure readings and down-hole vibration measurements. Flow surfaces are made out of Tungsten Carbide to prevent erosion and extend component life.

UBHO Sub O.D.	3.5 to 9.5in (larger on request)	89 to 241mmn
Transmission	Positive Mud Pulse	
Amplitude	Field Adjustable	
Sand Content	< 1%	
Maximum Pressure	- 20000 psi	
Minimum Flow Rate	35 US gals/min in water	8 l/sec
Maximum Flow Rate	1100 US gals/min in water	67 l/sec
Temperature	302°F (Hi-Temp to 347°F special order)	
Hydrostatic Pressure	Maximum 20,000 psi	137.9MPa
Operating Voltage	20-29V	
Nominal Current	12mA	
Shock	1000g/0.5millisecond	
Vibration	25g RMS 30-500 Hz Random, 30g 50-300 Hz Sine	
Mud Sand Content	Less than 1% recommended	
Lost Circulation Material	>50 lb/bbl premixed Medium Nut Plug or Cedar Fiber	





Inclination and Gamma @ Bit Flashlight for Directional Drilling

FEATURES

At bit inclination measurement / At bit gamma measurement
Adapts to any motor type
Tri Axle accelerometers / Tri Axle magnetometers
Continuous at bit inclination measurement
Vibration measurements / Temperature measurement
Shock and Vibration management
Works in oil and water based muds
All information is real time and memory loggable

SPECIFICATION

Length: 0.66 meters or 26 inches
OD: 4.75", 6.5"
Sensor accuracy inclination: +/-0.2 degree
Temperature: 300°F/150°C

APPLICATIONS

Directional Drilling Geo Steering
All drilling environments (mud, underbalanced, air)

BENEFITS

0.3 meter bit to sensor
Quicker Geo Steering decisions, faster decision process
Accurate drilling control, Reduced dog legs
Optimized well placement





Measurement While Drilling (MWD) Directional/Gamma

FEATURES

- Bottom Landing Pulser or Top Landing Pulser depending on the drilling conditions
- Temp 302°F (Hi-Temp to 347°F special order)
- Long battery life
- Variable Pulse Widths
- Field programmable
- Industrial standard Directional sensor
- Real time gamma and focused gamma

BENEFITS

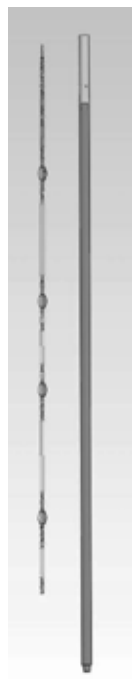
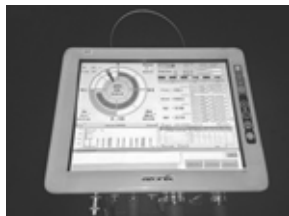
- Fully Wireline retrievable and re-seatable
- Adaptable to other MWD systems
- Ease of Maintenance and operation
- Packaged for field transportation

APPLICATIONS

- Short Radius wells
- Directional and Gamma wells

MWD MODULES – interchangeable

- Pulser (Top or Bottom Landing) Driver/ Battery Pack
- Directional Sensors/Electronics/ Gamma Bowspring or Finned Centralizers





Mud Pulse / EM / PEM ("2-in-1", Mud Pulse and EM MWD tool)

The MWD PEM system provides a rugged reliable solution for the most demanding directional drilling applications. The system can be used with a Positive Pulse or Electromagnetic Transmission. The Pulser and EM transmitter are modular design and can be interchangeable depending on the application. This system is completely adaptable to USDD's complete line of products.

FEATURES

- Bottom Landing Pulser or Top Landing Pulser depending on the drilling conditions
- Downlink switches operating parameters without tripping between Pulse and EM
- Temp 302°F (Hi-Temp to 347°F special order)
- Long battery life
- Variable Pulse Widths
- Field programmable
- Industrial standard Directional sensor
- Real time gamma and focused gamma

BENEFITS

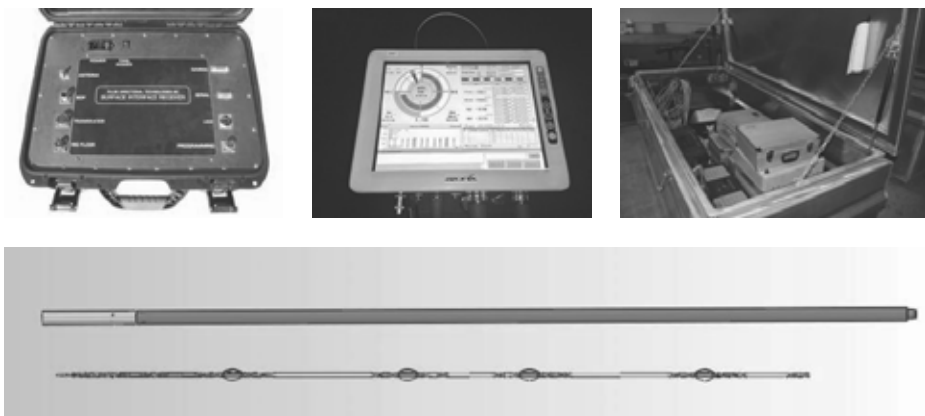
- Fully Wireline retrievable and reseatable
- Adaptable to other MWD systems
- Mud Pulse or EM compatible
- Ease of Maintenance and operation
- Packaged for field transportation

APPLICATIONS

- Short Radius wells
- Directional and Gamma wells

MWD MODULES – interchangeable

- Pulser (Top or Bottom Landing)/Driver Battery
- Directional Sensors/Electronics/Gamma
- Bowspring or Finned Centralizers





Ω Omega - Resistivity Tool

Omega will provide reliable propagation resistivity measurements for hydrocarbon in both high- and low-resistivity formations. Omega will also help to make fast and better real-time decisions while drilling, washing down, reaming, tripping—with minimum lost-in-hole risk.

BENEFITS

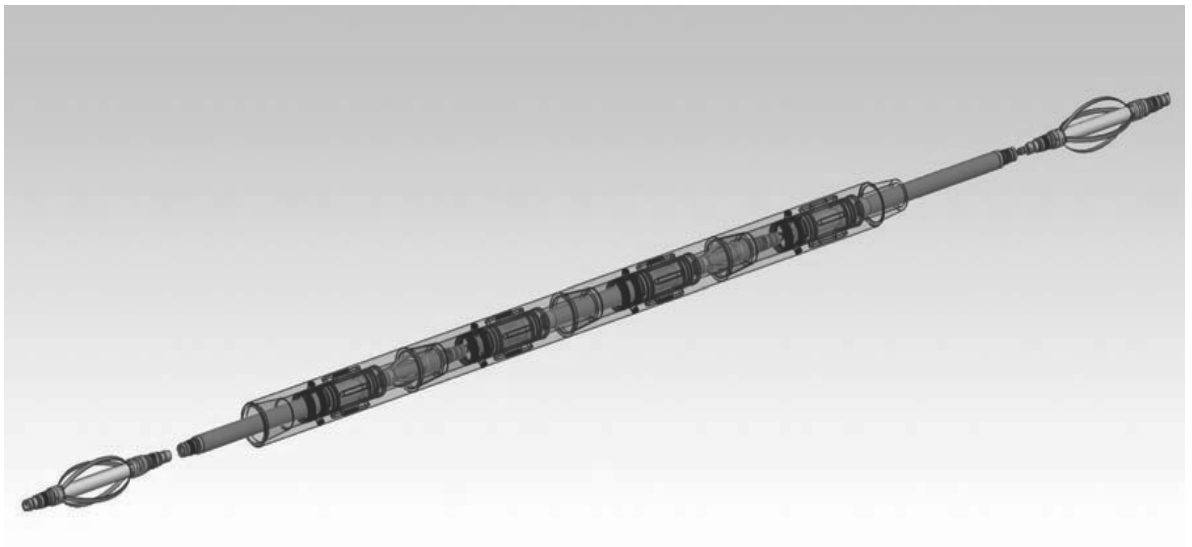
- Lower cost than competing resistivity tools
- Fully retrievable reducing LIH exposure for low cost operations
- Modular design for adaptive bit to sensor placement
- Can be used in collar sizes from 4" (102mm) to 8" (204mm) Can be run in water based muds and oil based muds
- Can be used together with Gamma, Directional and Annular Pressure modules in real time
- Will work in water/oil based drilling muds

FEATURES

- Fully Compensated 2 Frequency propagation Resistivity (2 MHz and 400 KHz)
- 4 depths of investigations
- Resistivity Real time updates
- Gamma, Directional and Annular Pressure real time updates
- Memory recordable high resolution logs
- Fully Retrievable

APPLICATIONS

- Bed Boundary Mapping
- Logging while tripping





Straight Hole Motor Costs

Motor Size	Cost/Day	Inspection	Recline	Re-Chrome
3 1/8"	\$2,500.00	\$2,000.00	*\$3,500.00	**\$2,200.00
3 3/4"	\$2,700.00	\$2,200.00	*\$3,700.00	**\$2,400.00
4 3/4"	\$3,100.00	\$2,200.00	*\$5,200.00	**\$3,900.00
6 1/4" - 6 3/4"	\$3,200.00	\$2,400.00	*\$6,200.00	**\$4,900.00
7 3/4" - 8"	\$3,500.00	\$2,700.00	*\$7,300.00	**\$6,000.00

Inspection charges are applied when motor is picked up, but is not charged every trip. It is a one-time charge per motor.

*Recline Charge may apply when using oil-base mud, air, some salt based fluids or drilling in H2S wells.

**Re-Chrome Charge will apply when using salt water drilling fluids.



MOTORS

Large Fleet of Drilling Motors - 3 1/8 – 8” OD

Hard Rubber Power Sections Set Up for Standard or Hot Hole Environments

Designed for Extremely High ROP

Advantages of Short bit to bend:

- 1.) Curve and Lateral in One Run
- 2.) Smaller Hole During Rotation
- 3.) Improved Build Rates
- 4.) Less torque in BHA

Available Configurations:

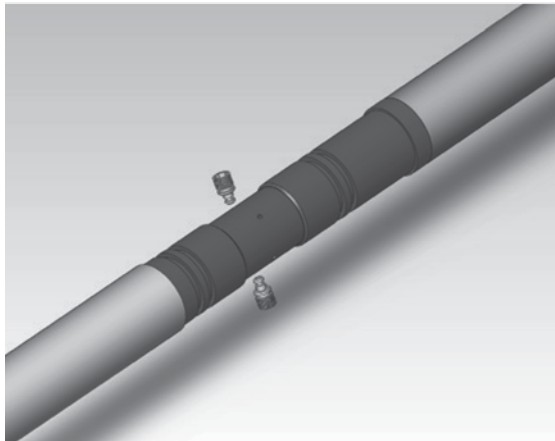
OD	Configuration	Rev/Gal	RPM
3 1/8	7/8 – 3.17 stage	1.69	135-240
3 7/8	4/5 – 3.5 stage	1.55	102-260
3 7/8	7/8 – 2.3 stage	0.768	61-130
3 7/8	7/8 – 6.7 stage	1.613	129-260
5	4/5 – 3.5 stage	1.02	100-250
5	4/5 – 6.3 stage	1.02	100-250
5	7/8 – 3.8 stage	0.521	78-140
6 1/4	7/8 – 4.8 stage	0.33	49-140
6 3/4	4/5 – 7.0 stage	0.497	149-300
6 3/4	7/8 – 5.0 stage	0.288	86-180
8	7/8 – 4.0 stage	0.166	48-143



Pulse Directional Technologies

Annular Pressure-While-Drilling (APWD)

Annular Pressure-While-Drilling (APWD) sensor increases drilling efficiency by providing real-time down hole pressure information that allows the driller to make that and better decisions.



BENEFITS

- Real-time pressure monitoring
- Fully retrievable
- Better Hole cleaning monitoring
- Detecting kicks and influxes
- Reduced drilling expenses
- As close to the bit as possible

FEATURES

- Adapts to conventional mud pulse tool string
- Memory recordable
- Equivalent Circulation Density (ECD) measurements
- Can be logged to most software

APPLICATIONS

- Reservoir pressure management
- Drilling optimization
- Improves ECD management
- Maintaining tight overbalance to optimize (ROP)
- Maintaining tight overbalance without reducing safety

Annular Pressure-While-Drilling Specifications

Nominal Tool O.D.	3.5"	4.75"	6.5"	8"
Connection	PH6 or SLH90	3 1/2 IF	4 1/2 XH	6 5/8 Reg
Length ft/meter	6/1.83			
Temp Rating (Celsius)	150			
Working Pressure psi	10,000			
Accuracy +/- psi	10			
Repeatability +/-	5			
Detector Type	Quartz			