



HIGH POWER TELEMETRY OPTION THAT ELIMINATES BATTERY CONSTRAINTS

As wells are drilled deeper (TVD) and further (MD), detection of EM signals becomes harder to maintain and less reliable. The typical response to more difficult drilling conditions is to "turn up the power" - increasing the frequency of EM transmission to improve detection on surface.

However, as power levels are increased, battery consumption increases dramatically introducing the risk of powering-out the tool before reaching TD. So there is balance required -- operating the EM system at a high enough power level to achieve surface detection versus avoiding deep trips due to battery depletion. FUSION EMc2 provides a solution to this challenge.

FUSION EMc2 provides a new (higher) level of power above our base FUSION EM which enables EM detection in areas where EM signal is traditionally lost. In addition, our proprietary mud-driven, downhole generator enables the FUSION EMc2 system to continuously operate at high power levels for as long as drilling conditions require without fear of depleting the batteries, losing power, and having to trip.

WHY CHOOSE FUSION EMc2?



All features of the FUSION EM system



Downhole mud-driven turbine generators supports longer drilling without battery depletion



Industry leading design for LCM tolerance

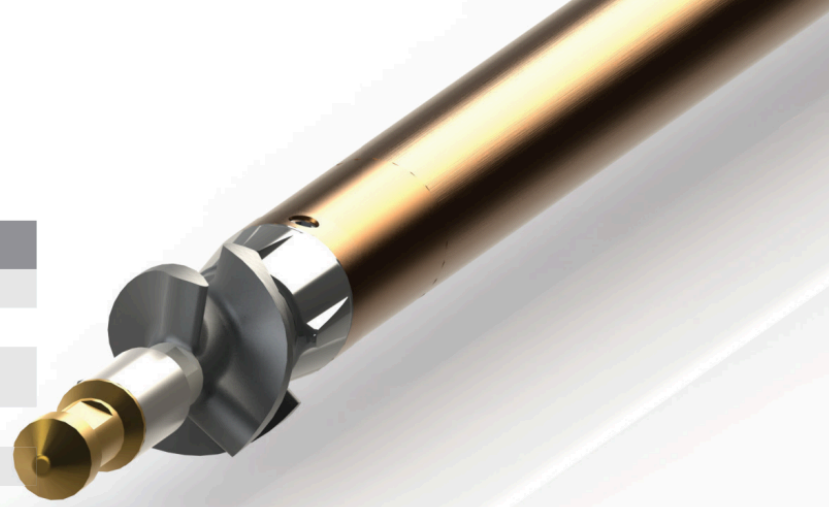
BENEFITS

- Eliminates surveying non-productive time (NPT) associated with mud pulse data transmission
- Enables drilling deeper and further with EM
- Captures EM time savings in more basins and formations across North America
- Transmits at higher data rates enabling more data to be available (faster) on surface
- Reduces the GHG (green house gas) generated during the life-cycle of conventional batteries

APPLICATIONS

- Deeper, longer wells requiring higher power levels to achieve detection
- Deeper drilling with OBM systems that render pulse tools ineffective
- Areas where conventional EM is not reliable and/or unable to achieve detection
- Wellbores with lost circulation issues
- Under-balanced and multi-phase drilling
- Wells requiring multiple agitators that render pulse transmission ineffective

Operating Parameter	Range
Power Source	EMc ² power unit
Transmission Depth	Not depth limited
Collar Size:	Flow rate 4.75" 0.9-1.4 6.5" 1.3-2.0 & HF config 1.9-2.6
Max Operating Temperature	302°F (150°C)
Max Hydrostatic Pressure	20,000 psi (135,000 kPa)
Mud Weight	No Restrictions
LCM Tolerance	Screen should be ran / avoid fibrous metrials



FUSION DELIVERS **CONSISTENT DATA TRANSMISSION** IN A **GREATER RANGE** OF **IMPEDANCE FORMATIONS**

OPERATING LIMITS FUSION EM										
Drill Collar OD x ID		Tool Joint Standard	Minimum Torque		Gap Sub Tensile Rating (Static Pull)		Max Flow Rate		Pressure Loss (H ₂ O @ Max Flow)	
(in)	(mm)	Type	(N-M)	(ft-lb)	lbf	daN	Litres/min	US GPM	kPa	Psi
4.75 x 2.68	121 x 68	NC 38	12,000	9,000	125,000	55,600	1,325	350	200	30
6.50 x 2.81	165 x 71	NC 46	31,000	23,000	150,000	66,700	2,275	600	400	60
6.50 x 3.25	165 x 82	NC 46	28,000	19,000	150,000	66,700	2,650	700	275	40
6.75 x 3.25	171 x 82	NC 46	28,000	19,000	150,000	66,700	2,650	700	275	40
8.00 x 3.25	208 x 82	6-5/8 REG	64,000	47,000	200,000	89,000	3,750	1,000	375	55
8.00 x 3.75	208 x 95	6-5/8 REG	64,000	47,000	200,000	89,000	4,550	1,200	275	40
9.50 x 4.25	245 x 108	7 H90	68,000	50,000	250,000	111,200	5,700	1,500	275	40

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FUSION EMc²