



Zone EM System

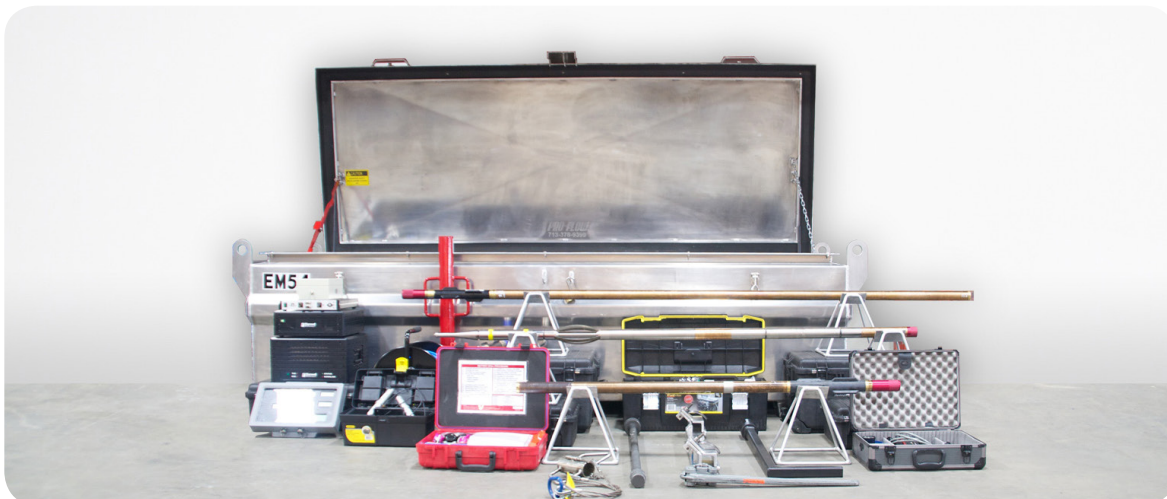
The Zone EM MWD System is a revolutionary approach for facilitating underground wireless telemetry. Unlike conventional EM receivers, the Data Fusion receiver utilizes multiple input channels to fuse various input/receive sources into a single decodable message. This enhances the receiver's ability to detect very weak signals through large amounts of noise. Every element of the system design has been optimized to extend operational health and improve noise immunity.

The down-hole system includes a rugged tool assembly consisting of a gap-sub antenna package, an electronics assembly, a gamma assembly and battery package. The surface system includes a power amplifier to provide two-way communication with the down-hole tool.

This tool is fully retrievable and is based on conventional OEM architecture enabling customers to utilize standard BHA components and common Tensor parts across their tool fleet.

FEATURES

- ✓ Specifically engineered internal and external dual gaps for optimal signal quality
- ✓ Fully retrievable and reseatable
- ✓ Acquire and decode data from both electrical and magnetic sources
- ✓ Utilizes "Data Fusion" telemetry, advanced noise cancellation and filtration technology
- ✓ High operating temperature (150 °C) and pressure (20,000 psi)
- ✓ Downlink capability allows bidirectional communication with down-hole tool



TOOL SPECIFICATIONS

TOOL LENGTH	Approximately 8m (26 ft.)
SIZE	57.15mm (1.875 in.)
PRESSURE RATING	137,895 kPa, (20,000 psi)
BATTERY CONSUMPTION	200+ Operating Hours depending on borehole conditions and transmitter power selection
MAXIMUM OPERATING TEMPERATURE	150 °C (302 °F)
DOWNLINK CAPABILITY	Electromagnetic transmission

OPERATING SPECIFICATIONS AND LIMITS

DATA TRANSMISSION TYPE	Low Frequency Electromagnetic waves
COLLAR SIZES	89mm-203mm (3.5"-8") Additional sizes available
OPERATING FLOW RATE	0.28 – 4.45 m ³ /min (75-1200 gpm)
WIRELINE RETRIEVABILITY	Retrievable and Re-insertable
MINIMUM I.D. FOR RETRIEVABILITY	57mm (2.25")
SHOCK LIMIT	1000g, 0.5 msec, ½ sine all axes
VIBRATION LIMIT	5 – 30 Hz @ 1" double amplitude, 50 – 800 Hz, 15g all axes
OPERATING FREQUENCY	2 to 12 Hz, User selectable via downlink
DATA TRANSMISSION RATE	1 to 12 BPS
MAX FLOW RATE	800 gpm
MAXIMUM DRILLING TORQUE	25,000 lbs.

SENSOR SPECIFICATIONS

PARAMETER	RANGE	RESOLUTION	ACCURACY
Inclination	0 - 180°	0.05°	+/- 0.10°
Azimuth	0 - 360°	0.18°	+/- 1°
Tool Face	0 - 360°	0.18°	+/- 1°
Dip Angle	0 - +/- 90°	0.18°	+/- 1°
Magnetic Field	0 – 100 µT	+/- 0.075 µT	+/- 0.003 µT
Gravitational Field	0 to 2G	3.9mG	+/- 3.0mG
Gamma Ray	500 cps	2 counts per API	+/- 10%
Temperature	0 - 200 °C	0.39°C	+/- 5°C

