

CW-EM

Wireline Retrievable Add-on EM MWD

Our high signal, power-efficient, reliable EM was developed by us in-house and underwent 12 years of continuous evolution, since our first full EM kit was produced in 1997 and our first prototype add-on EM tested in 1998. In response to industry need for high-spec, low-cost solutions, we now offer the commercial, advanced-performance version of the add-on EM kit: Continuous Wave add-on EM ("CW-EM"), providing the advantages of EM MWD at a fraction of the cost.



CW-EM tool assembly on the shop floor

Why use EM?

An EM tool's operation is independent of the drilling mud used, and will allow:

- ✓ Under-balanced drilling
- ✓ Drilling with air and foam
- ✓ Drilling with high concentrations of lost circulation material in mud

Achieve high-speed transmission without the mechanical wear and tear of a pulser: EM has no moving mechanical parts.

Investing in add-on EM

An add-on kit allows using existing MWD sensors and software with an EM tool - provides savings in the MWD budget; a simple plug-in for the existing mud pulse system makes EM MWD easy and straightforward to use.



Our surface receiver grounded

CW-EM Features

- Plug and play compatibility to industry standard Tensor mud pulse system – you can use your existing sensor package and software.
- Continuous Wave mode of transmission - the power efficient way to transmit signal through formation.
- Constant current automatic lithology compensation – provides power conservation during operation and signal reliably in challenging formations.
- Ultra low-noise receiver technology - based on leading edge scientific techniques.
- High signal output from downhole, achieved through economical transmitter design and our proprietary gap sub.
- Cryoton's performance rugged Gap sub - triple-insulated gap sub designed for no current leakage and with extra mechanical strength.
- Advanced mechanical durability - no moving mechanical parts, durable retrievable bulkhead, EM antenna stronger than the inner tool string, Cryoton EM gap sub stronger than all other BHA components.
- Slim tool design - tool is fully wireline retrievable.
- Fully surface-programmable receiver and transmitter settings.
- Talk-back while downhole through pump control - change EM power and frequency on demand.
- Intelligent flow switch - provides flow information and option to automatically double EM signal strength on-connection.
- Wireless transmission between remote receiver and MWD interface box (which with no cable to stretch can be placed anywhere, e.g. the doghouse)

CW-EM Specifications

Operating:	
Transmission Mode	Continuous Wave
Wireline Retrievability	Fully retrievable
Typical Operating Depth (no repeater)	10,000 ft (3,000 m) Maximum depth down to over 12,000 ft
Data Rate	2 bps
Operating Pulse Width	0.4-0.6 seconds
Battery	2x standard Lithium batteries
Typical Battery Life	Over 150 hours per battery
Maximum Power Draw	10W
Gap Sub OD available	8", 6 1/2", 4 3/4", 3 1/2"
Tool Programming	Fully surface programmable
Downlink	Pump-control: EM power and frequency downhole – programmable
Downhole:	
Operating Temperature	150C (302F)
Maximum Pressure	20,000 psi (137.9 MPa)
Shock	1,000g
Vibration	30-500Hz 20g all axes
Surface:	
Operating Temperature	-23 to 52C (-9 to 126F)
Storage Temperature	-40 to 52C (-40 to 126F)

Cryoton (UK) Ltd also provides:

Full sensor EM, with low-cost accurate directional package, optional gamma (pressure coming soon), wireline retrievable.

Custom-built EM solutions: add-on EM for non industry-standard mud pulse systems.



Unit 7, Llanoed Court, D'Arcy Business Park, Llandarcy, Neath, UK SA10 6FG

Phone: 44(0)1792812081 Fax: 44(0)1792295753

e-mail admin@cryoton.com