



BlackStar II Dual-Telemetry MWD Tool

Combining the latest in EM and mud-pulse technology with the most durable and efficient design on the market delivers a cost-effective MWD solution

NOV's **BlackStar™ II** dual-telemetry MWD system combines the capabilities of both electromagnetic (EM) and mud-pulse (MP) data transmission, allowing for continuous drilling operations in the most challenging of conditions. With our BlackStar II retrievable MWD system, switching from EM to MP transmission can be performed via EM or RPM downlinking to avoid costly trips to change out equipment.

The BlackStar II tool's modular design allows flexibility in configuring the toolstring to maximize operational capabilities. Directional, drilling, and formation data are measured downhole and transmitted to surface as either EM waves or pressure pulses, where they are processed and displayed on the drilling console.

Tool programming is performed via the BlackStar II software suite with an easy-to-use drag-and-drop user interface. The system offers multiple user-programmable frames: survey, steering, and rotation. This allows for optimal data transmission and update rates, while reducing power consumption. The BlackStar II system offers a full suite of MWD sensors including directional, gamma, internal and annular pressure, axial and radial vibration, RPM, and temperature. In addition, the system is retrievable. For stuck-in-hole situations, the equipment can be brought to surface, saving the cost of replacement.

The BlackStar II dual-telemetry MWD system offers many key advantages over more traditional MWD systems:

- Ability to slide out of casing shoe
- Two available methods of telemetry
- Can be run as standalone EM or MP system
- Fully retrievable
- Eliminate trip during runs with high concentrations of lost circulation material
- Eliminate trips when switching from fluid to nitrogen or air

The BlackStar II system allows you to leverage your existing MP equipment. By incorporating our translation module, a standard off-the-shelf pulser can be run with the BlackStar II system with no modifications to either the BlackStar II system or the off-the-shelf pulser.

To learn how our BlackStar II dual-telemetry MWD tool can help you obtain fast and accurate downhole measurements through EM and MP transmission, contact your local NOV representative or visit us online at www.nov.com.

Features and Benefits

Diverse power management capabilities

- Enables increased power output (up to 40 watts)
- Offers the ability to shut down the transmitter while rotating
- Allows modules to operate from a single 28 V battery stack
- Provides dual-battery support

User-configurable options

- Offers multiple user-programmable frames: survey, steering, and rotation
- Allows for multiple open-circuit voltages in step increments
- Enables additional measurement channels: axial, radial, and total vibration

Onboard memory logging

- Directional module – surveys stored in memory
- Gamma module – gamma ray stored in memory

Third-party integration

- Allows compatibility with stepper and brushless DC motors or solenoid type pulser
- Enables use with downhole instruments using generic variables

Gamma and pressure modules

- Integration of gamma (360° and DRG) module, with optional annular and internal pressure