

URSA is Scientific Drilling's new rugged, high-angle gyroMWD sensor, built using SDI's propriety solid-state gyro sensors. URSA represents strength and resilience and is named for its association with one of mankind's most historic navigational aids.

Available in a range of configurations utilizing SDI telemetry or as an integrated module within our directional partner's MWD systems with service packages ranging from complete to ZeroPOB, URSA gyroMWD enables the ultimate flexibility in precision wellbore placement.

- + Precision surveying in the presence of magnetic interference
- + Advanced quality control systems for collision avoidance

For more information on improving your wellbore surveys, contact your Scientific Drilling Representative or visit:

<http://scientificdrilling.com/wellbore-surveying>



APPLICATIONS

- + Collision avoidance
- + Close proximity drilling
- + Magnetic ranging
- + High-angle directional wells
- + Gross error detection
- + Reduced error ellipse
- + Offshore and onshore drilling
- + Multi-well and pad drilling
- + Congested fields and platforms
- + Batch drilling
- + Riserless top hole drilling
- + Magnetic interference zones
- + Whipstock orientations & kickoffs
- + Extreme environments

BENEFITS

- + Ruggedized sensor package and robust Quality Assurance.
- + Enables high-accuracy surveying in multi-well environments with real-time true gyro tool face
- + Provides seamless compatibility with existing MWD and RSS in top hole sections
- + Allows continuous gyro tool face while sliding
- + Enables operational efficiency through flexibility of BHA configurations
- + Significantly reduces cost and time by eliminating the requirement for wireline orientation and survey check-shot runs

MECHANICAL SPECIFICATIONS

COLLAR SIZES	4.75 in. (120.65 mm)
	5.25 in. (133.35 mm)
	6.5 in. (165.1 mm)
	6.75 in. (171.4 mm)
	8.00 in. / 8.25 in. (203.2 mm / 209.55 mm)
9.50 in. (241.3 mm)	
PROBE OD	1.75 -2.5 in. (44.5 - 63.5 mm)
PROBE LENGTH*	13.3 ft (4 m) in addition to mwd probe

*Length is for URSA directional package, additional LWD e.g. gamma / PWD tools will increase length accordingly. Additional length may be added to enable flexible BHA placement

ENVIRONMENTAL SPECIFICATIONS

PRESSURE RATING	20,000 psi (137,895 kPa), 30,000 psi (206,843 kPa) Available on request
TEMPERATURE RATING	302°F (150°C)
VIBRATION RATING	20 g _{rms}
OPERATING TIME**	300+ hrs

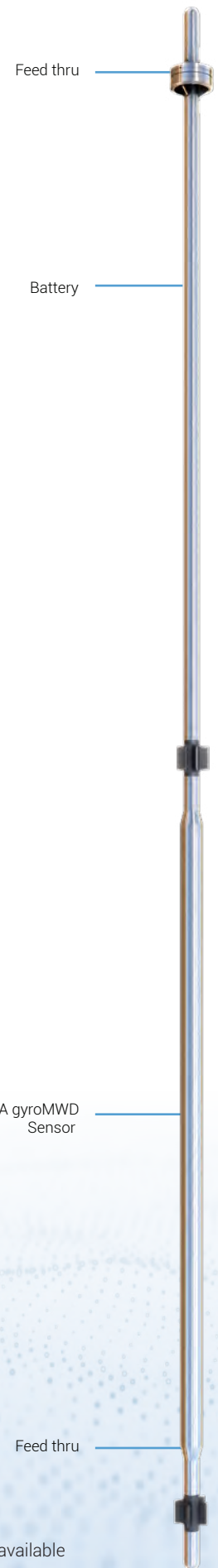
**Operating time varies based on slide / rotate ratio and profile

INSTRUMENT & SYSTEM SPECIFICATIONS

SENSOR TYPE	North-seeking mass rate solid-state gyroscope (URSA) 3- Axis hi-shock accelerometer	
MEASUREMENT	ACCURACY*	RANGE
Inclination	±0.1°	0°-80°
Azimuth	±0.1°	0°-360°
Tool face	±0.1°	0°-360°
CALCULATED OUTPUTS	Inclination, Azimuth, Gravity TF, Gyro Tool Face, Temperature, Shock & Vibration, Continuous Inclination (sliding and rotating)	
TELEMETRY	Compatible with 3rd party MWD systems Compatible with SDI MP and EM systems	
DATA RATE	0.5-5 bps (MP), 3-14 bps (EM)	
COMPATIBLE TOOLS	Gamma Ray Azimuthal Gamma Ray Pressure While Drilling Resistivity	

*Error ellipse calculations available upon request. System accuracy subject to well profile.

Specifications are subject to change without notice



Innovatively designed with global industry advancements and efficiencies in mind, Scientific Drilling's URSA gyroMWD technology is optimized for a visionary, industry-first approach to remote operations.

With URSA gyroMWD, fast, detailed, and dependable gyroMWD survey acquisition is combined with advanced quality control systems, allowing peace of mind in an accurate survey program.

Multiple configurations available