



## CONTINUOUS RANGING. FULL WELL CONTROL. PRECISE EXECUTION.

Gunnar Energy Services' CT-RWD system delivers real-time magnetic ranging within a fully pressure-contained coiled tubing drilling assembly. Designed for proximity-dependent operations where positional uncertainty and consequence are elevated, CT-RWD converts ranging from a discrete wireline intervention into an integrated drilling function. Active magnetic excitation is embedded directly within the BHA, enabling deterministic distance and directional updates to the target wellbore while maintaining full pressure-control integrity throughout convergence and intercept execution.

## DESIGN ARCHITECTURE

CT-RWD eliminates the structural limitations of legacy wireline ranging while preserving uninterrupted drilling. Excitation, detection, and telemetry are integrated within the coiled tubing BHA, enabling continuous ranging without additional intervention events.

CT-RWD features:

- Fully integrated coiled tubing drilling assembly
- ~2x current injection capability relative to wireline systems
- Embedded all-angle gyro compatibility

## TECHNICAL PERFORMANCE

In high-consequence intercept environments, excitation strength and signal stability govern detection range and positional resolution. CT-RWD is engineered to optimize both.

CT-RWD provides:

- Real-time distance and directional updates
- Reliable operation in OBM, WBM, and total-loss conditions
- High dogleg capability (~35°/100')
- Ranging integrated through build sections

Higher injected current strengthens casing excitation and expands detection range. Increased electrode surface area improves galvanic coupling, delivering stable, high-fidelity magnetic response at the sensors.

## OPERATIONAL ADVANTAGE

Relief intercept operations demand continuous well control without additional exposure. CT-RWD integrates ranging directly into the drilling workflow, without introducing additional exposure or pressure-control risk.

CT-RWD delivers:

- No dedicated ranging trips
- No wireline entry into live wells
- Sustained drilling momentum through convergence

## FIT-FOR-PURPOSE APPLICATIONS

CT-RWD deployed in operations where positional certainty and operational containment are equally critical.

### Wellbore Intercept & Reconstruction

- Relief wells
- Legacy well reconstruction
- Fish bypass and re-entry
- High-build convergence geometries

### Wellfield & Infrastructure

- Solution mining intercepts
- Vertical water well intercepts
- Limited surface-access operations

## GENERAL SPECIFICATIONS

### TARGET DETECTION

MAXIMUM RANGE	200 ft [60 m], modeled
3D POSITION UNCERTAINTY	7% of total distance*
STANDARD RANGE	100 ft [30 m]
3D POSITION UNCERTAINTY	5% of total distance*
CLOSE RANGE	10 ft [3 m]
3D POSITION UNCERTAINTY	3% of total distance**

\* From active direction triangulation, if complete target well survey report exists

\*\* From active gradient field measurements

### MEASUREMENT HARDWARE

NOMINAL OD	1.875 in [47.6 mm]
MAX TEMPERATURE	347°F [175°C]
MAX PRESSURE	15,000 psi
GYRO LENGTH	46.125 in [1.17 m]
GYRO OD	1.875 in [47.6 mm]

### SOFTWARE

Proprietary software automatically generates a new intersect well plan after each ranging shot, an industry first