

Applications

- Directional and horizontal drilling
- Custom drilling
- SAGD drilling

Benefits

- Reduces survey time and costs with continuous inclination and survey quality inclination measurements
- Increases integration flexibility as it can be placed near-bit (above motor) or in alternate positions within the MWD toolstring

Features

- High-operating temperature: 150°C (302°F), 175°C (347°F)
- 24-bit on-board processor for data acquisition and function calculations
- Powered from battery bus
- qBUS with generic variables or CAN Bus (model dependent)

INC-RINC Module

Continuous-Rotation Inclination

Bench Tree's INC-RINC inclination-only module can be deployed in MWD-LWD systems to complement the directional module. It provides operators with precise and dependable inclination and continuous inclination measurements to maximize drilling efficiency in directional and horizontal wells.

The INC-RINC module enables faster drilling by allowing partial surveys (inclination and gamma) to be telemetered in lieu of full directional surveys. This drastically reduces the amount of data to be transmitted, reducing survey time.

Enhanced Performance

Bench Tree's INC-RINC digital output module is calibrated using patented and proprietary calibration technology, ensuring consistent accuracy. When used in legacy MWD-LWD systems, inclinometer data is transmitted independent of the system's orientation module as a generic variable.

INC-RINC module data can be recorded in the MWD system controller memory and pulsed to the surface, providing real-time information. It can be configured for semi-custom applications and proprietary systems.

To maximize your drilling efficiency and speed, contact the Bench Tree sales team for assistance.



Physical Specifications

Parameter / Feature	Values / Ranges
Size	1.38 x 11.25 in. (3.51 x 2.86 cm)
Weight	1 lb (.45 kg)
Operating voltage	7 to 38VDC
Operating power	< 1W peak watt
Communications	qBUS, CAN, or customer spec.
Connections	MDM, 15P & 15S, up to 15 thru wires
Built-in sensors	Temperature, precision accelerometers (Q-Flex®)

Performance Specifications

Parameter / Feature	Values / Ranges	Generic Variable
Inclination	<±0.1° / 0 to 180°	GV0
Rotation/continuous inclination ¹	±0.35° @ Inc >20° / 0 to 180°	GV1
Gravity	<±1.5 mg / 0 to 2 gees	GV2
Gravity toolface	0 to 360°	GV3
Temperature	<±2°C (±3.6°F)	GV4
Rotation (0 to 300)	±12 RPM	
Drilling inclination	±0.35° typical	
Memory	Not accessible	

Environmental Specifications for Performance

Parameter / Feature	Low				Max for standard models			
	Low		Max for standard models		Low		Max for standard models	
Operating temp, std ²	25°C		150°C		175°C		185°C	
Survival temperature	-40°C		200°C		200°C		200°C	
Temperature ramp	3°C / minute max							
Vibration	20g Grms, 30 to 1000 Hz							
Shock	1000g 0.5mSec-½Sine							

- 1: Derived from the typical field performance of Bench Tree's RINC feature, available with DPU2 downhole processor
- 2: Contact Bench Tree for other ranges
- 3: Contact Bench Tree for other configurations

Q-Flex® is a Registered Mark of Honeywell
Metric units are approximations

Connection Assignments

Pin/Socket	Legacy Ref Des	Used by Module
1	Ground	*
2	Batt1	
3	Batt2	
4	Batt Bus	*
5	Tx/Rx	qBUS, 485 ³
6	Pulse	
7	Flow	1
8	Gamma	
9	Mode1	CAN ³
10	Mode2	CAN ³
11 - 15	Available upon request	

