

Tools that Think!

Cybercoil's Advantage

- Positively identifies the lateral window and junctions to help optimize drilling techniques
- Ensure laterals are open and contributing to production
- Capable of placing stimulation chemicals in each open leg to help improve production
- Leg isolation techniques could be applied
- For time efficiency the tool kicks off, via E-coil, in any direction
- A single run in the hole to navigate all the open laterals in a well



Cybercoil - Multilateral Well Intervention Service

Cybercoil combines downhole electric motor and state-of-the-art sensor technologies to directly enter well laterals.



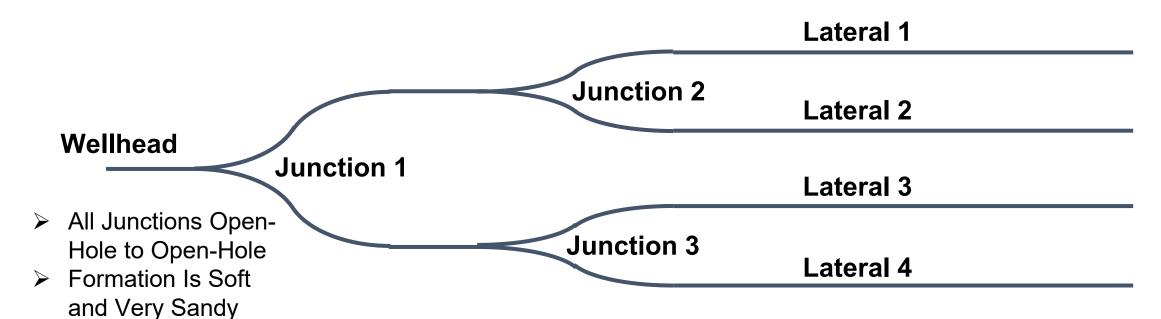
Intelligent Technology Enables Confident Lateral Re-Entry



- Positively Identifies the Lateral Window
- Positions the Kickoff Joint in the Lateral Window
- Automatically Adjusts Kickoff Plane for Tool Orientation
- Maintains Outer Lateral Wall Contact as Tool Is Advanced
- Realtime Comparison with Reference Azimuth, Inclination and Gamma Data



Cybercoil Case Study Building on Its Early Success



- Never Re-Entered after Drilling
- Light Water Jetting for Clean out
- Successfully Entered 3 of 4 Laterals
- Characterized Blockage at Window to Lateral 4
- Navigated Lateral Windows 13 Times during the Job
- Confirmed Lateral Entries with Azimuth and Inclination Data



Cybercoil Unlocks Multilateral Intervention

- ➤ Light Cleaning of Laterals to Help Improve Production
- ➤ Cleaning of Lateral Windows to Allow Lateral Access
- Capable of Placing Stimulation Chemicals to Improve Production
- ➤ Nitrogen Cleanout Compatible to Remove Well Debris
- ➤ Supports the Use of 3rd Party Washing Systems (SpinCatTM)

Additional Termination Subs in Development

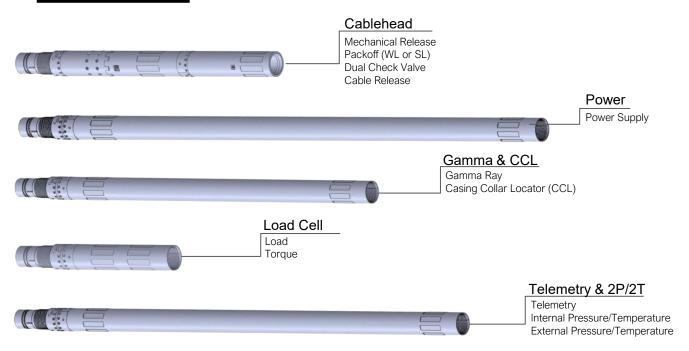
- Packer Setting Termination
 - Shutoff Applications in Laterals
- Plug Setting/Retrieving Termination
 - Retrievable Plug Applications in Laterals



Cybercoil - Tools

Base Tool

7



Sensors

- Internal Pressure/Temperature
- External Pressure/Temperature
- Board Temperature
- Gamma Ray & CCL
- Tension, Compression, & Torque
- Azimuth

- Inclination
- Vibration
- Open-hole Detection
- Casing Window Detection
- Depth Encoder
- 2-Way Communications

Specifications

Available Sizes	2 7/8"
Cable Head Connection	2 3/8" PAC
Temperature Rating	350°F
Pressure Rating	10,000 psi
Tensile Strength	100,000 lbf
Maximum Torque	2400 ft-lb
Maximum Pump Rate	8.3 bpm*
Ball Drop	3/4"
Communications	FO/Electrical
Lower Crossover	2 3/8" PAC





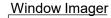
Cybercoil – Tools

MLT Tool



Imager Electronics

Master Microprocessor Custom Imager Electronics Programmable to Match Well Conditions Kickoff Load Analysis

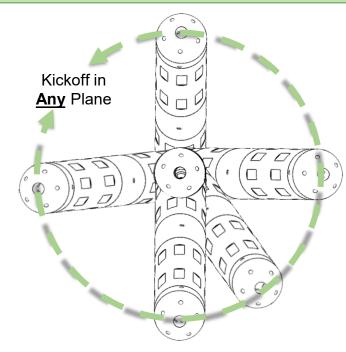


6 Ultrasonic Sensors
Data to Surface Every 0.5 seconds



High Precision Motor Control High Resolution Halll Sensor Feedback Optimized for Use with Standard E-Line



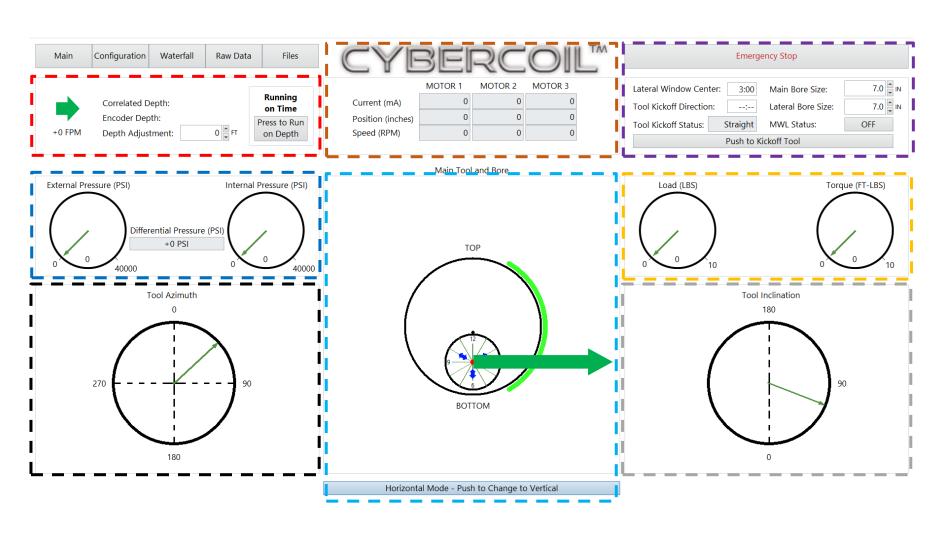


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Cybercoil Software – Window Entry Control Screen



Tool Data

(Every 0.5 Seconds)

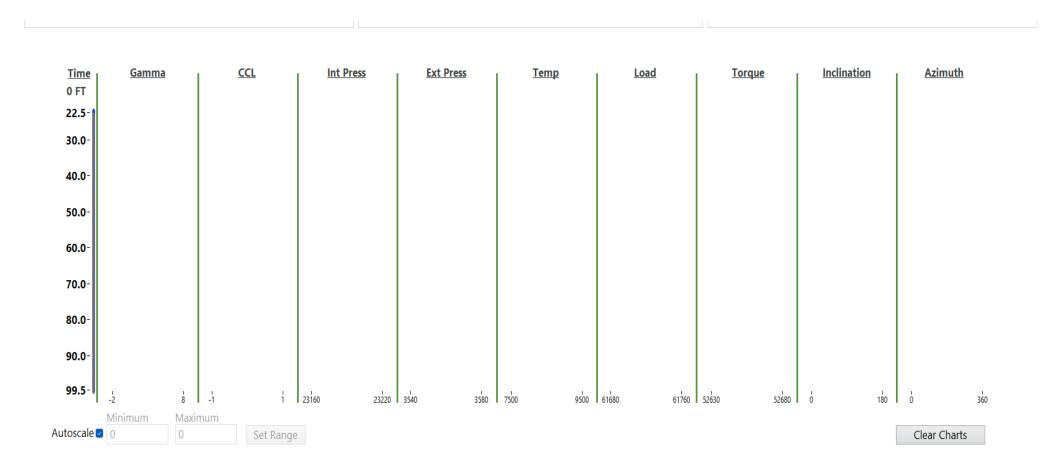
Correlated Depth
Display
Internal and External
Pressure
Tool Azimuth

Motor Status
Tool Orientation,
Window Location and
Kickoff Status View
Kickoff Control
Load and Torque
Tool Inclination



Real Time Data – Additional Screens

Real Time Logs





Real Time Data - Additional Screens

Real Time Raw Data

Scaled Decimal Data	Unscaled Decimal Data Hexad	lecimal Data Send Com	mands				
			CCL				
0	0	0 0	0	0 0	0		
MCUTemp C	Line Voltage	GR rate	G Data Msg Cou	nter Tin	ne		
0	0	0	0	0			
PB400 Data							
Load	Torque	Temperature_1	Temperature_2	Pressure_1	Pressure_2		
0	0	0	0	0	0		
Accelerometer_1_X	Accelerometer_1_Y	Accelerometer_1_Z	Accelerometer_2_X	Accelerometer_2_Y	Accelerometer_2_Z		
0	0	0	0	0	0		
Magnetometer_X	Magnetometer_Y	Magnetometer_Z	Strain_Gauge_1	Strain_Gauge_2	Strain_Gauge_3		
0	0	0	0	0	0		
Ultrasonic_1	Ultrasonic_2	Ultrasonic_3	Ultrasonic_4	Ultrasonic_5	Ultrasonic_6		
0	0	0	0	0	0		
Motor_1_Position	Motor_1_Target_Position	Motor_1_Speed	Motor_1_Target_Speed	Motor_Controller_1_Temperature	Motor_1_Current		
0	0	0	0	0	0		
Motor_2_Position	Motor_2_Target_Position	Motor_2_Speed	Motor_2_Target_Speed	Motor_Controller_2_Temperature	Motor_2_Current		
0	0	0	0	0	0		
Motor_3_Position	Motor_3_Target_Position	Motor_3_Speed	Motor_3_Target_Speed	Motor_Controller_3_Temperature	Hardware_Status_Code		
0	0	0	0	0	0		
48V_Power_Supply_Temperatur	re 48V_Power_Supply_Input_Voltage	48V_Power_Supply_Output_Voltage	48V_Power_Supply_Output_Curr	ent Upper_PB400_Temperature	Lower_PB400_Temperature		
0	0	0	0	0	0		



How Cybercoil Can Help

Plugged new drills

Producing wells encountering production drops

Bull heading- start chemical placement

Gather data on underperforming wells

Cybercoil provides valuable information and well intervention in multilateral wells.



Thank You!



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