

WIRELESS DRILLING SENSORS

Aircraft Accurate and Oilfield Tough



The **3PS** Drilling Sensor provides accurate and reliable measurements of Torque and Hook Load (tension & compression) taken directly from the drill string at the surface. The data is live and high density providing low range, high range and sensitive changes to torque and hook load. No longer must Hook Load and Drilling Torque be measured anywhere but directly from the drill string. Easy to install, the data is sent by wireless telemetry to a floor based Receiver, providing immediate measurements of important drilling parameters.

3PS is the leading supplier of ruggedized force sensors for aircraft, winches, and cranes. Since 2000, **3PS** has been supplying wireless sensors to multiple markets that all share the need for high reliability, including long term underwater applications.

This unique experience to solve customer problems in diverse markets led to the successful configuration of standard **3PS** products to measure drilling tension and torque directly in line with the drill string.

The same **3PS** factory which produces aircraft weight and center of gravity systems, manufactures Oil & Gas Drilling systems. The quality management system is certified AS9100B for Aircraft/Aerospace, as well as, ISO9001:2000 and ATEX.



ACCURATE & RELIABLE

Standard and Unique Thread Sizes

Standard API Threads

- ◆ NC40 (4 FH)
- ◆ 4½ Regular
- ◆ NC46 (4½ XH)
- ◆ NC50 (4½ IF)
- ◆ 6⅝ Regular
- ◆ 6⅝ Full Hole
- ◆ NC70
- ◆ NC77
- ◆ 7⅝ Regular
- ◆ 8⅝ Regular

AIRCRAFT QUALITY ALLOY STEEL
OR STAINLESS STEEL SENSOR
MATERIAL AVAILABLE.

CONTACT 3PS
FOR ANY THREAD SIZE.



MEASUREMENTS AVAILABLE:

STANDARD

- ◆ TORQUE
- ◆ HOOK LOAD

OPTIONAL

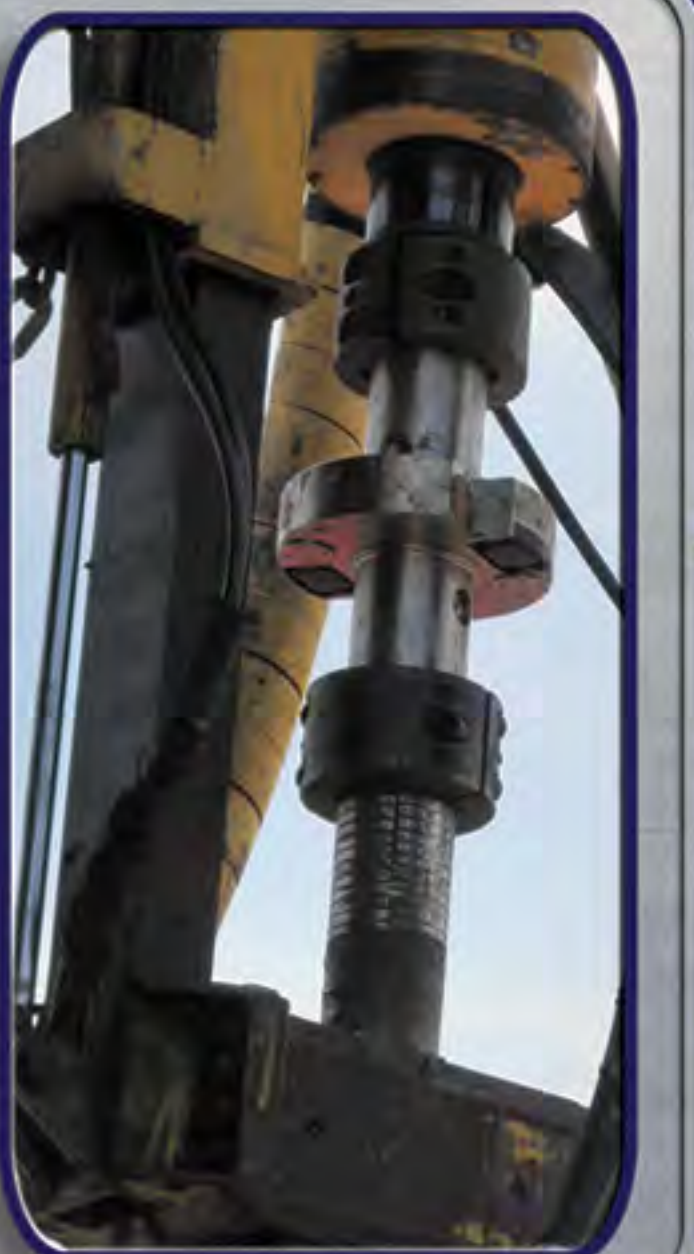
- ◆ RPM
- ◆ PRESSURE
- ◆ 3-AXIS ACCELERATIONS
- ◆ BENDING MOMENT
- ◆ SHEAR

High Precision & Accuracy

- MEASUREMENT RESOLUTION
 - Torque 1.5 Ft-lbs out of -50,000 to +50,000 Ft-lbs
 - Hook Load 30 lbs out of -50,000 to +1,000,000 lbs
 - RPM 1-RPM out of 15 to 250 RPM
 - Pressure .23psi out of 0 to 7,500 psi
 - Acceleration .02 G out of 70 G
- TOTAL COMBINED ERROR
 - Torque: + 1% of Full Scale
 - Hook Load: + 1% of Full Scale
 - Pressure: + 1% of Full Scale
 - Acceleration: + .25% of Full Scale
- Measurement Range Of Torque and Hook Load Can Be Specified By Customer

Reliable Electrical & Mechanical Design

- Shock and Vibration Tested to 90G and Down-Hole Tool Test Profile
- Field Operations Include Airhammer Drilling Operations
- Battery Life Continuous Days Typical:
 - Torque and HookLoad - 42 days
 - Torque, HookLoad, and RPM - 42 days
 - Torque, HookLoad, and Pressure - 40 days
 - Torque, Bending Moment, and Shear - 40 days
 - X,Y,Z Accelerations - 17 days
- All Sensors Tested Operating at -40° C and +65° C
- Sensor Intrinsically Safe, Hazardous Area Certified ATEX Zone 1 and CSA/UL Class 1, Division 1, Some Optional Measurements are Pending Certification



RF Receivers

- Hazardous Area Certified ATEX Zone 1 and CSA/UL Class 1, Division 1 and Safe Area Units Available
- Transmission Rates 50Hz Standard and 20Hz to 100Hz Available Depending on Battery Life Requirements
- STANDARD OUTPUTS:
 - RS232 (Digital) of Standard and Optional Measurements Selected and also Battery Gauges
 - 4-20mA Current Loop Torque
 - 4-20mA Current Loop Hook Load
- OPTIONAL OUTPUTS:
 - RS485, Ethernet, available upon request for Safe Area

All Systems
RF Range Tested
to 1,200 Feet

Displays and Dataloggers

Ruggedized Safe Area Displays Available Including:

- Drillers Display with Analog & Digital Displays that Connects to 3PS Receiver RS232 Port
- Portable Battery Powered Wireless Display with Discreet Digital Torque and Hook Load Values
- Data Logging Laptop Computer with Software for Data Storage, Transfer, and Analysis

Ruggedized Position and Encoder Transmitters

- Encoder Input Position Transmitters for Customer System Level Calculations (Battery Life 17 Days Continuous Use Typical)
- Proximity Sensor(s) Position Transmitters Also Available (Battery Life 48 Days Continuous Use Typical)
- Ruggedized Intrinsically Safe Encoders with Shaft Decoupling and Shock/Vibration Isolation Available for Connection to 3PS Encoder Transmitter

Certified for ATEX Zone 1 or CSA/UL Class 1, Division 1 Hazardous Area

CALIBRATION & SUPPORT

3PS FACTORY CALIBRATION CAPACITIES

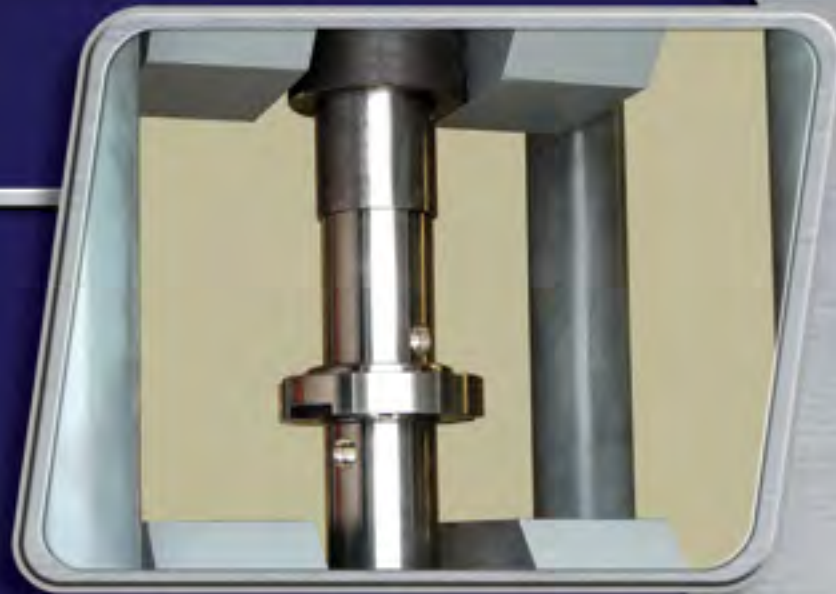
- **3PS** Operates 16 Hours Per Day M-F And Can Provide Immediate Calibration Support Traceable To The US National Institute of Standards & Technology (NIST)
- No Manual Data Collection; All Calibration Data Collected With Data Acquisition Electronics
- Multi Point Calibration Validations Are Collected After Each Calibration And Provided With Calibration Certificate

DRILLING SENSOR ACCESSORIES

- Spanner Wrench Accessory Available To Assist In Make-up and Break-out Of Sensor In Drill String Without Use Of Tong Dies



- Sensor Transit Stand For Transportation and Storage
- Torque Calibration Stand With Data Acquisition System For Performing Your Own Testing



Tension up to 3 Million LBS
Torque up to +300,000 FT-LBS



Transit Stand

