

ULTRASONIC INTELLIGENT SENSORS

ClampOn DSP Well Collision Detector

DIGITAL SIGNAL PROCESSING



“This tool replaces 10 highly experienced roughnecks” NORTH SEA OPERATOR

ADVANTAGES

- **Advanced real-time collision monitoring system**
- **Greater drilling safety**
- **No hot work permit required**
- **Low risk investment**
- **No production shut-down**

BACKGROUND

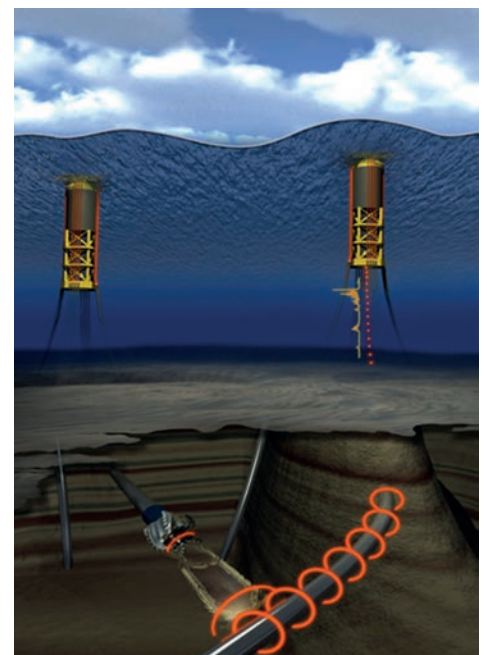
The use of directional drilling is increasing in the oil and gas industry. Often, a new well is to be drilled in an area with little space to existing wells. Proper collision avoidance techniques should be considered when preparing for the drilling operations. The ClampOn DSP Well-Collision Detector is an excellent tool for avoiding collision when drilling in close proximity to existing wells.

OPERATING PRINCIPLE

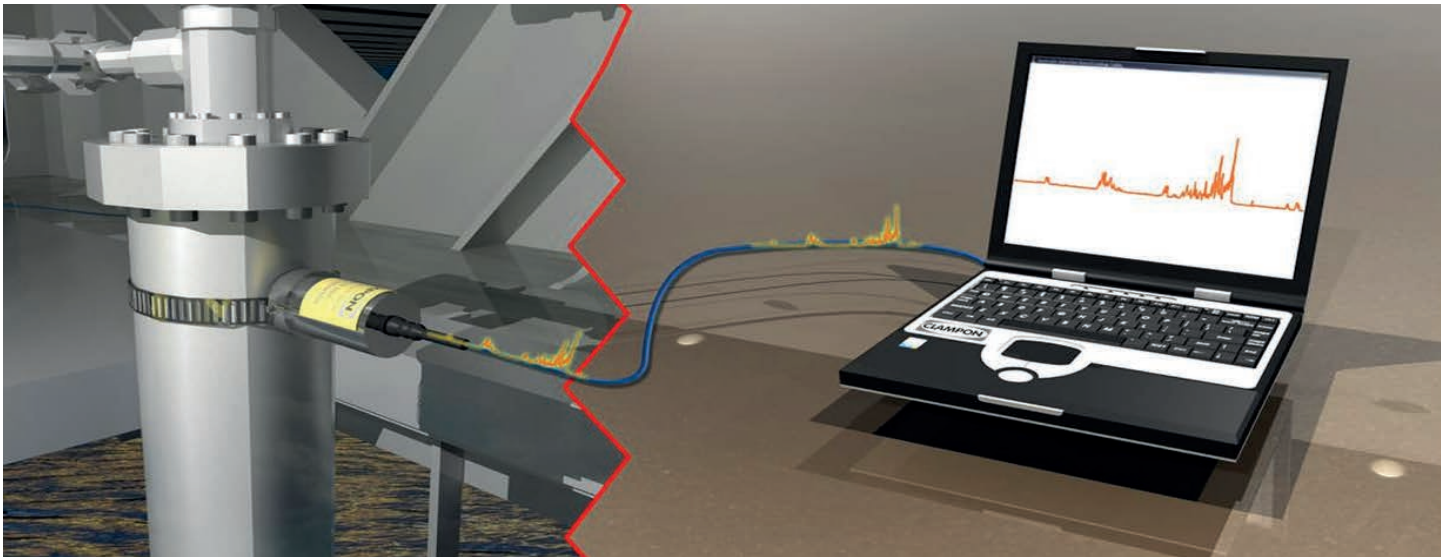
ClampOn uses non-invasive ultrasonic sensor technology that continuously monitors signals at a wide frequency range. The instrument digitizes ultrasound generated by the drill string, travelling along the casing of the existing well, allowing signal analysis in real-time.

With ClampOn's DSP Well-Collision Detectors installed topside on existing wells, close to the well being drilled, the instruments can detect and warn if a drill string gets in near proximity of an existing well.

When a significant increase in the ultrasonic signal level is observed, drilling is halted and data further analysed. After analysis, the drill string can be diverted, or drilling can resume with the confidence that a collision has been avoided or that initial calculations have been confirmed.



Signal increasing as drill string approaches the existing well.



Sensor in operation, providing data to ClampOn computer for instant analysis.

GOALS

- Prevent drill bit from colliding with existing well casing during directional drilling operations
- Give engineers warning of a drill string's proximity to existing wells
- Help to increase safe drilling speed and decrease downtime caused by collisions
- Milling Operations – confirmation of cutting through casing etc.

BENEFITS

- Advanced real-time collision monitoring system.
- Much greater drilling safety.
- Minimal equipment and personnel requirements.
- Low-risk investment for operator.
- Complete package supplied by ClampOn:
 - ClampOn DSP Well-Collision Detectors
 - Cables
 - Computer with well-collision detection software
 - Highly skilled and experienced personnel supporting the driller.

INSTALLATION

- Fast and simple installation of hardware (non-invasive instruments)
- No hot work permit required
- Intrinsically safe sensors
- No need for production shut-down to install
- Minimal impact on daily operations on the platform
- Mounted with clamping bands
- Installed and monitored by qualified ClampOn personnel 24/7 whilst drilling

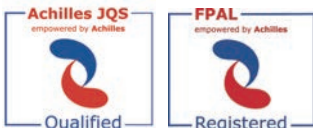
- All necessary hardware supplied as rental package from ClampOn.

TYPICAL RENTAL SET-UP

- 6-12 ClampOn Sensors
- Cables and power supply unit
- Computer w/ software
- ClampOn supervised 24/7.

KEY SPECIFICATIONS

• Method of operation	Passive acoustics on multiple frequencies
• Processing	DSP inside sensor unit
• Installation principle	Clamp-on (non-intrusive)
• Hazardous Area	Zone 0, 1, 2
• Certification code	Ex ia IIB T2-T5
• Ambient temperature	-40 °C to 60 °C [-40 °F to 140 °F]
• Power supply	12-25VDC (from IS PSU) - 1,5W / 2,1W per sensor
• Communication	RS-485 (ClampOn proprietary DSP protocol)
• Sensor material	SS 316
• Sensor weight	< 3Kg
• Ingress protection	IP 68



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NORWAY: ClampOn AS, Vaagsgaten 10, NO-5160 Laksevaag, Bergen, Norway, Phone: +47 5594 8850, Fax: +47 5594 8855, e-mail: mail@clampon.com - **USA:** ClampOn, Inc., 15720 Park Row, Ste. 300 (77084), PO Box 219206 (77218-9206), Houston, TX, USA, Phone: +1 281 492 9805, Fax: +1 281 492 9810, e-mail: infoinc@clampon.com – **WEB:** www.clampon.com