

Wellhead Installation Digital Position Sensing

Real-time feedback to ensure correct installation of internal wellhead components

-  Saves significant rig time per casing or tubing string installed
-  Confirms position of hangers and packoffs during wellhead installation

Applications

- Offshore and onshore
- Wellhead installation

How it improves wells

Increased wellhead installation efficiency and accuracy in addition to

- reduced opex
- significantly minimized risk of leak paths by requiring zero wellhead penetrations
- curtailed human intervention by removing high-risk activities for personnel

How it works

Real-time feedback of position data from sensors installed on the wellhead to confirm the status of installation and landing

What it replaces

Conventional manual procedures, which can create hazardous risks for personnel and uncertainty in equipment installation that can result in costly unplanned downtime to remedy

Wellhead installation landing challenges

Correct installation of the wellhead system is critical, with any misalignment of the rig over the well potentially resulting in improperly landed hangers and packoff seals. The result is significant downtime to conduct costly recovery operations, especially at remote onshore well locations and offshore platforms. These perilous conditions can be caused by

- rigs not centralized over either the hole or wellhead
- cantilever movement of the derrick on jackup rigs
- tilted hangers.

The conventional method used to ensure that each component of the wellhead system is installed properly is manual and subjective: conducting space-out from the rig floor, marking landing joints and using weight indications, and opening side outlet valves to check the marks on internal components. This task sequence for physically measuring the landing joints from the rig floor to the internal wellhead profile of each component is typically done in constrained spaces and introduces the risk of openhole operations when performing visual inspections through the side outlet valves.



The wellhead installation digital position sensing solution unambiguously confirms correct landing positions.

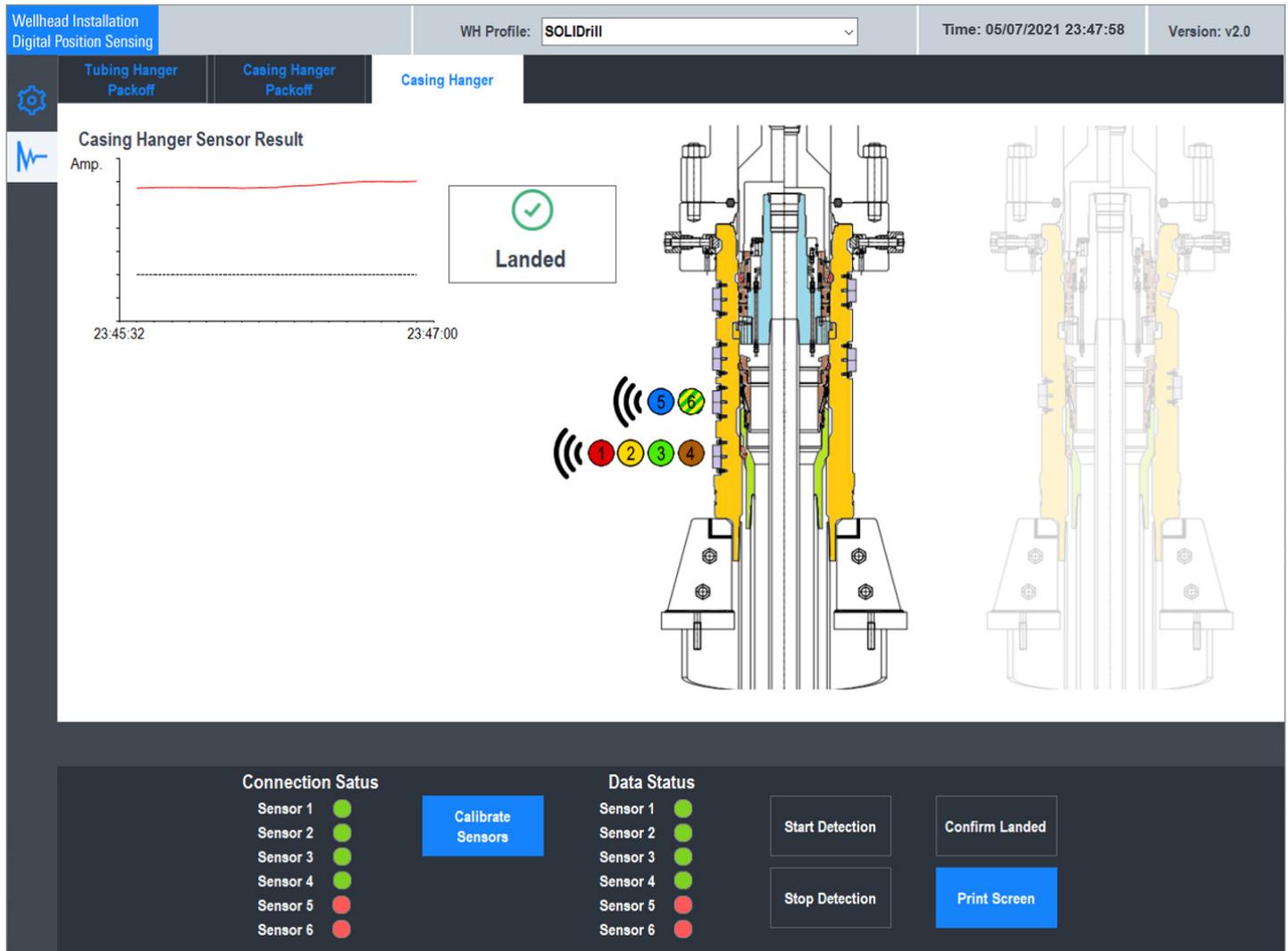
Accurate, collaborative digital position sensing solution

By keeping both field technicians and operators collaboratively informed in real time, wellhead installation digital position sensing provides a high level of confidence that the wellhead hangers and packoffs have been installed properly. The result is a faster, more reliable installation process that supports more efficient and effective well construction.

The digital position sensing solution for wellhead installation is nonintrusive and modular, consisting of a mobile device with software, position sensors, and an installation tool kit. The position sensors are attached to the wellhead during the installation process.

For real-time monitoring of casing hanger installation, while the casing is landed on the appropriate load shoulder in the wellhead housing, the sensors read the equipment position. Real-time analysis with an algorithm accuracy greater than 99% assigns a binary signal of green for correct landing or red for not landed. If the landing is correct, the installed sensors continue to monitor the casing hanger to ensure that no lift occurs during cementing operations. Once cementing operations are completed, the sensors are repositioned on the wellhead housing to monitor installation of the packoff assembly for confirmation of correct positioning and lockdown, depending on the wellhead configuration. Installation confirmation continues until all strings are installed.

Wellhead installation digital position sensing



The software component of the wellhead installation digital position sensing solution analyzes the positions of the equipment.

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