DATA SHEET

HALLIBURTON

INTELLIGENT COMPLETIONS | PERMANENT MONITORING

DataSphere® LinX® monitoring system

Behind-casing reservoir monitoring

FEATURES

- Configurable for a range of well designs, including single-zone, multizone, intelligent, standard, subsea, and dry-tree completions
- Compatible with Halliburton DataSphere® Opsis® permanent downhole gauges
- Supports operation of LinX® system equipment and Opsis® gauge equipment through the same interface card and downhole cable

BENEFITS

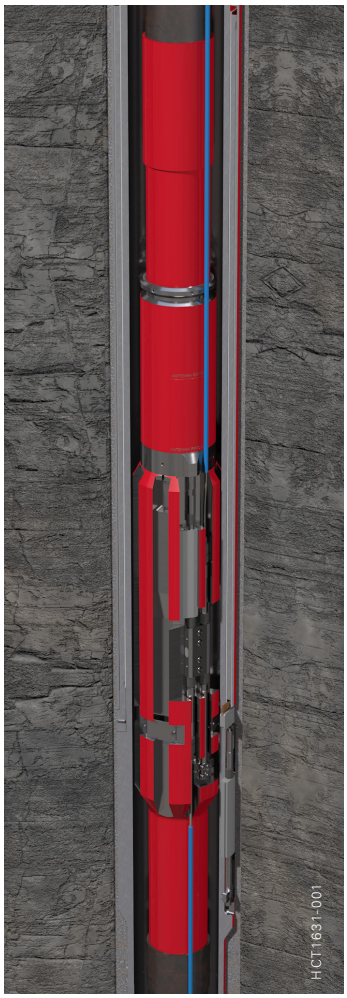
- Cost-effective alternative for monitoring connectivity throughout a field
- Continuous monitoring of injector-producer communication
- Improved understanding of connectivity among stacked reservoirs
- Monitoring of communication between producing and nonproducing reservoirs
- Pressure measurements near the top of the reservoir to help identify potential out-of-zone injection and support caprock-integrity assessment

Overview

Operators seek to improve reservoir recovery, operational control, and safety throughout the life of the reservoir while managing costs. As field-development requirements evolve, understanding connectivity between formations and throughout the field can support more informed reservoir-management decisions.

Continuous pressure and temperature monitoring behind casing provides a cost-effective method for evaluating communication between formations. Monitoring pressure near the top of the reservoir can also help improve injection management and support the identification of potential out-of-zone injection or caprock-integrity concerns.

The LinX® monitoring system is part of the DataSphere® permanent monitoring suite. It uses wireless through-casing power and communication to support reservoir monitoring from behind the well barriers. LinX system sensors are installed close to the formation of interest and are designed to support well-integrity objectives while helping minimize changes to the well design and drilling program.



The Halliburton LinX® monitoring system showing the LinX-200 casing and tubing mandrels

How it works

The LinX® monitoring system uses wireless through-wellbore technology to support the permanent placement of a pressure and temperature gauge behind casing or liner within the cement sheath.

Electromagnetic power and communication operate the sensor without batteries or additional barrier penetrations.

An industry-standard cable and IWIS interface card provide the connection to the surface. This configuration allows the LinX system to be combined with traditional downhole monitoring equipment on a single cable.

The LinX system measures pressure and temperature changes within the formation. These measurements can help operators identify pressure responses associated with producing or injecting wells in the following areas:

- Overburden
- Caprock
- Reservoir

The resulting information can support field-development planning, injection optimization, and risk-management activities. The LinX system gathers data that can help characterize communication:

- Between injector and producer wells
- Between producing zones
- Between producing and nonproducing reservoirs
- Across the wider field

This information can support field-development strategy and future well-placement decisions. In applications where dedicated monitoring wells might otherwise be considered, the LinX system offers an alternative method for gathering formation data from a well that intersects the interval of interest.

LinX® 200 ™ monitoring system casing mandrel

Three-step monitoring process

The LinX system uses electromagnetic energy to power and communicate with quartz pressure and temperature sensors:

1. A sensor and coil assembly is installed on the casing or liner using a custom casing pup joint.
2. A second sensor and coil assembly is installed on the tubing using a custom tubing joint. The tubing-conveyed sensor connects to the surface through a conventional downhole cable.
3. The paired coils transfer electromagnetic power and communications to and from the casing-conveyed sensor.

Because the system transfers power electromagnetically, the casing-conveyed sensor does not depend on a downhole battery. This design supports repeated data transfer for long-term permanent-monitoring applications.

DataSphere® LinX® monitoring system gauge specifications

DESCRIPTION	SPECIFICATIONS
Pressure range / Temperature range	0-20.000 PSIA / -20 – 200˚C (14 – 392°F)
Calibration ranges	200 - 10.000 PSIA / -10 – 150˚C (-4 – 302°F) 200 - 20.000 PSIA / 25 – 200˚C (77 - 392°F
Stated accuracy in calibrated range	1.5 psi / 0.5 ˚C
Typical accuracy in calibrated range	1.2 psi / 0.15 ˚C
Resolution (per sec)	< 0.006 psi / < 0.005 ˚C
Drift at maximum pressure and temperature (per year)	0.02% FS / < 0.1 ˚C
Cable type	1/4-in. OD Mono-conductor/TEC
Gauge material	MP-35N / Per NACE MR-0175
Electrical wellhead requirements	1-pin conductor
Maximum downhole capacity	7 gauges / 21 sensors
Seals and terminations	Dual metal-to-metal Field pressure testable
Space out tolerance	1 ft

For more information, contact your local Halliburton representative or visit us on the web at www.halliburton.com