# HELIX™

## Advanced Condition Based Monitoring & Fault Prediction for Piping Systems

Predictive Detection

Advanced Data Storage and Processing

Revolutionary Non-Invasive Sensing

Informed Decisions

# Advanced Sensing Approach For Pipeline Systems

The HELIX™ device uses patent pending distributed piezoelectric sensors and an innovative clamping structure for the sensors which mounts externally on the pipe wall to non-invasively monitor the piping systems' important structural and acoustic parameters. This data is processed in the cloud to predict and monitor important piping variables such as pipe wall thickness and stress corrosion, slug flow, leaks, flow rates, pipeline current and pipe condition.

Unlike other piping monitoring systems, the novel HELIX™ device is easy to install and remove using the innovative clamping system. The robust design offers resistance against vibration, shock, dirt and moisture.

## HELIX CARE
### SERVICE SOLUTION PACKAGE

- System assurance
- Tech support and upgrade releases
- Real time status monitoring
- Performance evaluation adjustments
- Remote troubleshooting

# Monitoring Turned Predictive

HELIX™ technology utilizes AI/ML paired with Cloud computing and data processing to offer continuous and proactive monitoring of your piping system's internal integrity. HELIX™ uses advanced non-invasive piezoelectric sensors for early detection and prompt decision management.

- Enhances and supports the health of Cathodic Protection systems
- Ensures that Cathodic Protection performance is at optimum levels
- Alert the end user of system malfunctions including over or under ptimal protection levels and standard current limits
- Enables the end user to monitor the Impressed Current Cathodic Protection (ICCP) system remotely
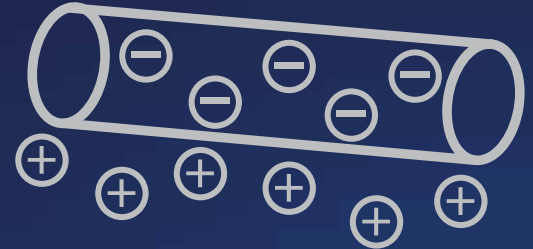
## Cathodic Protection Efficency

- Non-invasive corrosion & erosion continuous monitoring
- Identify trends in wall thickness changes for improved decision making and overall health of piping systems
- Integrated with HELIX™ alerts & notification module to support responsive field support service model suitable for harsh environments without requiring pipe surface preparation for installation

## Corrosion

- Real-time detection and monitoring of slugging patterns
- Non-intrusive installation and continuous observing of multiphase flows
- Slug flow pattern recognition predicted from transitioning flow patterns
- Slug flow data maps used in AI/ML training
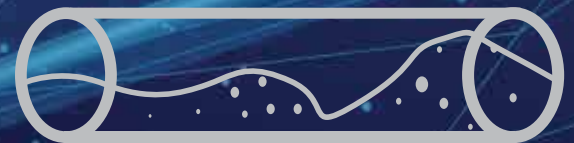
## Slug Flow

- Pipe leakage determined from pressure changes in pipe sections or at a single point due to environmental and resistance factors.
- Deep learning and acoustic piezoelectric sensors for pipe crack detection
- Automated alerts to field support of leak incidents

## Leak Detection

- Leverage predictive maintenance to mitigate valve failures and faults to reduce unplanned downtime
- Collected data supports valve condition using the HELIX™ sensor to calculate overall health indicators
- Scalable ML models forecast valve performance based on pressure measurements and flow behavior and increase pump life expectancy

## Pump and Valve Failure

## Remotely Monitor the Health of Pipeline Systems

The HELIX™ device will machine learn to recognize the specific parameters of varying disturbances in your pipeline system to detect and predict problems before they occur to reduce unplanned repairs and catastrophic events.

Data collected from non-invasive HELIX™ placement locations is analyzed on-site, wirelessly transmitted for Cloud integration and sent to the off-site system operator for predictive monitoring and remote inspection.

# The HELIX™ Backend Brain

- Site survey & simulator
- Manager monitoring tools
- Message queue
- Model assistant
- Alerts & notifications
- Retrain & deploy

## Key Features

- Small form factor
- Simplicity of installation & operation
- Ruggedized for harsh environments
- Solar power capability

- Custom signal conditioning, WiFi meshing, 4G, 5G and GPS
- Cloud, Fog and Edge AI/ML
- Service and support package

## Intelligence

The patent pending intelligent design of the HELIX™ device and its machine learning capabilities create a visual global data profile of the internal health of your piping system.

By implementing self-learning, our enterprise clients are reducing operating cost through automated inspections and audits thus maximizing production efficiencies.

Deep learning for images, video, and audio offers additional automation for unexpected event classification and prediction.

# HELIX™

By: **OFMS**LLC

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## Digital Transformation