DxS Browser Visualization Software

Transforming Distributed Sensing Measurements Into Actionable Data

For more than 10 years, OptaSense, a Luna company, has been providing the oil and gas industry with unmatched fiber optic-based distributed acoustic, vibration, strain and temperature sensing data. Integrating the voluminous amounts of distributed data can be challenging. With hundreds of deployments generating daily volumes of data in the Terabytes range, with some projects reaching the Petabyte range, the need for fast and efficient Distributed Sensing (DS) interpretation software is greater than ever.

### Optimizing Distributed Data Set Integration and Analysis

The OptaSense DxS Browser™ software suite allows users to quickly extract and visualize the features of distributed sensing data that are needed for analysis. From temperature and strain, all the way to acoustics, the DxS Browser software enables you to display and interpret features in time-synchronized data. With the DxS Browser software, you can integrate data from different distributed sensing interrogators (including DTS, DSS, DVS, etc.) syncing based on time and distance. In addition, you can incorporate time series data from a variety of point sensors, such as pressure and temperature gauges, as well as distance-based measurements such as a PLT well log.

Large-volume distributed sensing data can encompass long periods of time. The DxS Browser software lets the user visualize long-term data and dynamically zoom in and select those times that are of interest. This type of functionality enables users to efficiently assess long-term trends in their data.

Customizable Reporting and Analysis

When it comes to integrating multiple distributed data sets with conventional logging and point sensor data, the DxS Browser improves the interpretation process by allowing users to easily present and configure visuals for reports and analysis. Customizable layouts allow the user to display waterfall data and various curves in both the spatial and time domain. The DxS Browser enables the user to fully interpret distributed sensing data in the domain that best showcases the signals of interest.

Distributed sensing has the power to monitor continuously or at specific time periods. The DxS Browser allows users to synchronize large volumes of data so that visualization can focus on those specific periods when signals and regions of interest
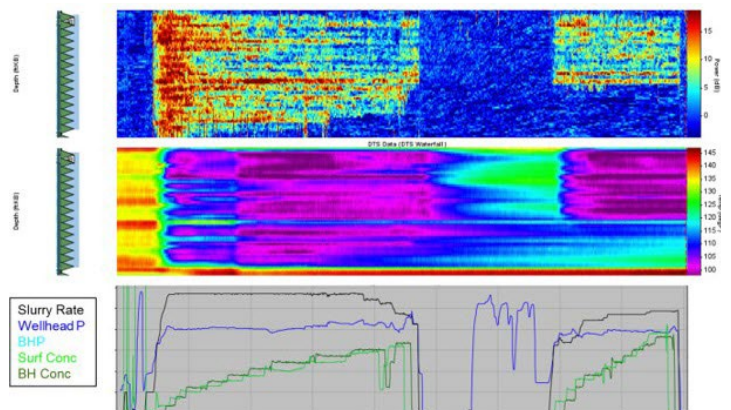
DxS Browser panel with waterfall of acoustics, temperature and curve data

may arise. Analysis of multiple data streams and curves allows DxS Browser users to better integrate various measurements for understanding various physical processes in the most comprehensive fashion.

Robust Processing and Visualization Capabilities
The advanced processing capabilities of the DxS Browser allow the user to analyze the spectral content of signals and generate Frequency Band Extracted (FBE) data for interpretation. The broad spectrum of bandwidth, from near static to greater than 100kHz, that is characteristic of distributed sensing datasets can be examined using the DxS Browser channel analyzer and the spectrogram viewer. Characterization of the signals of interest has never been so easy. Our advanced distributed sensing data management makes efficient use of computing resources resulting in processing that can be done in most modern personal computers. Processing features allow for the reduction of raw sensor data into forms that can be displayed effectively.

The DxS Browser functionality further allows for the spatial reference of the various distributed sensing streams. By referencing various devices like valves, pipeline joints, perforations, and any other source of known signals to a specific sensor channel or set of channels, users can visualize specific device responses. Visualization and animation of dynamic datasets is possible with the DxS Browser's movie viewer that allows you to see how your signals change over time. Time-based animation of distributed data allows the user to visualize dynamic physical events along the length of the fiber that are not obvious in a FBE data such as flow in a wellbore.

Flexibility Using DxS Browser Plug-In Module

OptaSense's clients routinely develop specific algorithms for dealing with features in distributed sensing data. The DxS Browser plug-in feature allows the user to include their own Python script to solve proprietary computations. This flexibility enables users to take advantage of the large-volume distributed sensing data handling provided by the DxS Browser while using their own unique algorithms. The DxS Browser Plug-in module enables algorithm plug-ins to integrate with the distributed sensing spatial and temporal data for efficient processing. It enables quick visualization and integration to other datasets. In addition, the plug-in allows the use of third-party visualization for those unique displays of data.

DxS Browser Features

✓	**Compatible with industry standard distributed sensing data (Prodml H5, WITSML, CSV)**
✓	**Visualization of select sensor data (i.e. strain)**
✓	**Visualization of FBE waterfall data (2D and 3D rendering)**
✓	**Visualization of distributed sensing data attributes (i.e. averages, channel amplitudes, etc)**
✓	**Visualization of discontinuous datasets**
✓	**Time synchronization and matching between different data streams**
✓	**Distributed Sensing data cleanup and conversions**
✓	**Spatial referencing of Distributed Sensing data**
✓	**Spectral Analysis of DAS channels**
✓	**Spectrogram Analysis of waterfall data**
✓	**Conversion of raw DAS data into Frequency Band Extracted (FBE)**
✓	**Data utilities for data export into SCADA systems.**

DxS Browser Plug-in Module Features

✓	**Run Python scripts from DxS Browser**
✓	**Visualization of custom-made distributed sensing datasets**
✓	**Access to 3rd party visualization embedded in Python**

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