

## FMS

### Fiber monitoring suite software

#### APPLICATIONS

- Interface and control from
  - WellWatcher Ultra\* DTS acquisition system
  - WellWatcher Ultra ASE\* accurate single-ended DTS acquisition system
  - WellWatcher Hyperion\* portable DTS acquisition system

#### BENEFITS

- Streamline management and reservoir surveillance
- Allow sections of the sensing fiber to be assigned either one or multiple assets, providing a separate measurement output from any part of the sensing fiber
- Create manual or automatic scheduled tasks
- Allow users to create integrated to-scale asset schematics
- Enhance data exchange through industry-standard protocols

#### FEATURES

- Ability to restore DTS function after power disruption
- Automatic return to an acquisition status using the last system configuration
- Data viewing screens
- Conversion of DTS data into other standard formats
- Control and configuration of DTS systems
- Monitoring of overall system condition including the status, health, and diagnostics
- Data delivery in a variety of protocols
- Ability to set frequency of data acquisition and measurements of fiber length

The FMS\* fiber monitoring suite software is a menu-driven project manager suite of applications offering local and remote control of WellWatcher\* permanent monitoring systems' DTS acquisition units. The software guides users through the setup of a distributed fiber measurement, automating many of the tasks and ensuring that the appropriate alarms are set. The software also keeps track of critical fiber parameters. The acquisition unit enables remote interrogation to be used to troubleshoot problems quickly and efficiently and to predict whether maintenance will be required in the near future.

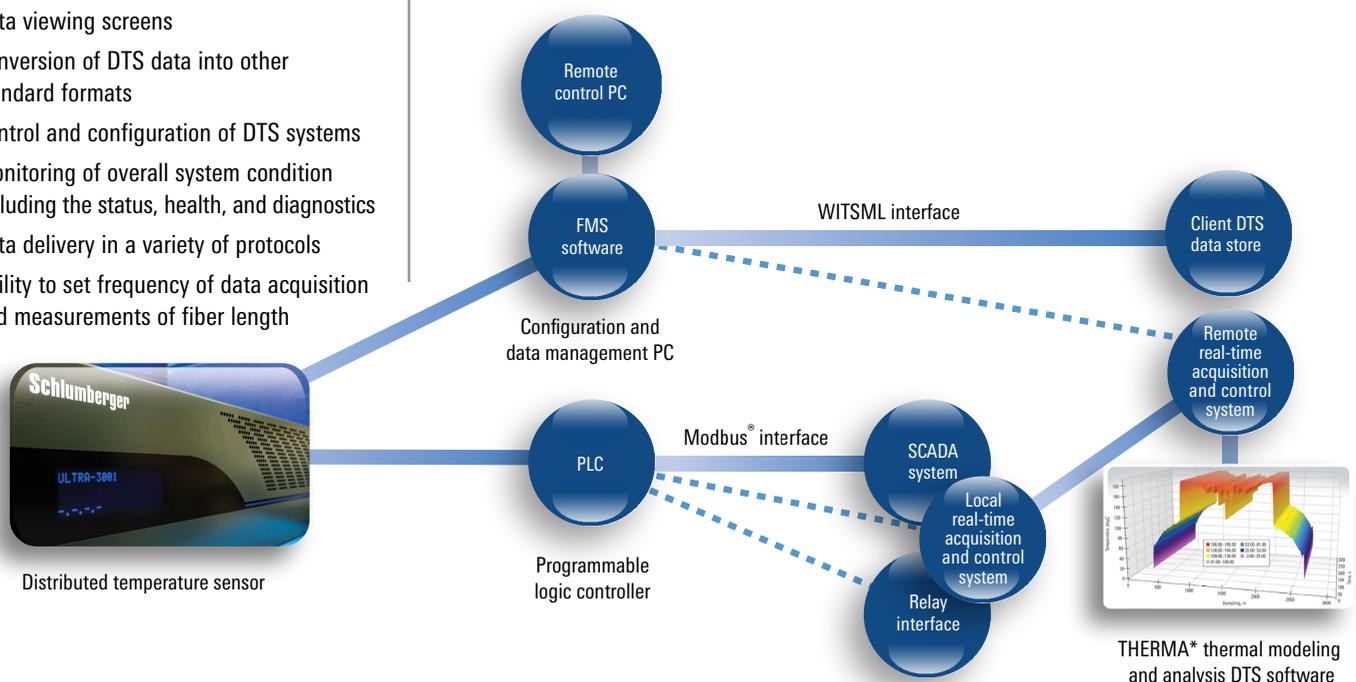
#### Enhanced functionalities

Components of the FMS software ensure the best possible DTS system functionality.

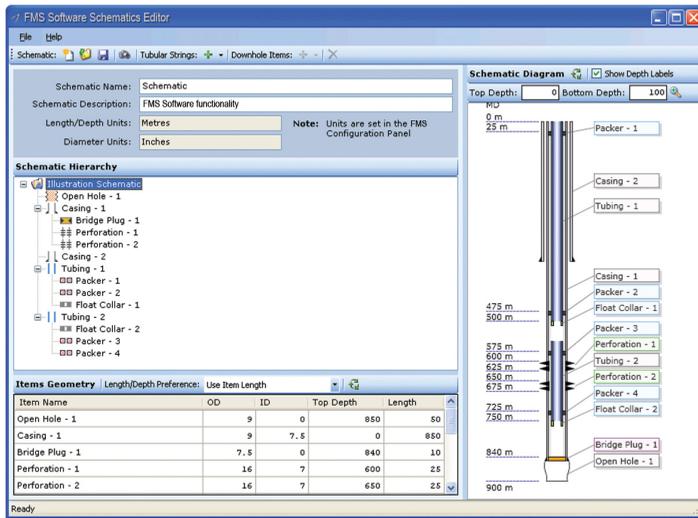
**FMS Software Configuration Panel**—Stand-alone application used to configure and change various aspects of the FMS software, such as units and data storage frequency and location. It can also be configured to restore the DTS function after a power disruption. If a power failure occurs, the DTS and accompanying industrial acquisition computer can automatically return to an acquisition status by using the last system configuration, minimizing data loss during the power outage.

**FMS Software Manager**—Main application for controlling and configuring DTS systems, including setting up the frequency of data acquisition, measuring fiber length, and defining measurement type. System status, health, diagnostics, and communication validation utilities are all quick tools to provide visual checks on the overall condition of the DTS system and a means of allowing users to validate key items.

Manager can also be used to match part of the sensing fiber length to the length of the well. Each acquisition channel of the DTS system may have a sensing fiber made up of surface cable and fiber within a well or, potentially, within multiple connected wells. The FMS software allows sections of the sensing fiber to be assigned either one or multiple assets. This means that any part of the sensing



Schlumberger DTS systems use various forms of data delivery; the generic DTS system architecture is shown above.



FMS software allows the creation of integrated to-scale asset schematics used as overlays in profile visualizations and as illustrations. These schematics can help identify the reasons for temperature anomalies.

fiber can be used as a separate measurement output. Typically, the start and end of the well are selected to create an asset. After an asset is allocated, the asset can be stretched or squeezed to match the completion length, or it can be depth-corrected to match an operator's well depth reference. In other words, the data delivered for each well will already be aligned to the well, easing the interpretation process. The corrections applied are all reversible if required.

**FMS Software Data Explorer**—Onsite data reviewing and quality control validation tool that allows users to query and view historical DTS profile data. This tool supports individual profile charts, stacked profiles for comparison, time-based plots for one or more points along the fiber, loss plots for raw data measurements, 25-point standard deviation for any trace, and 3D visualization of any set of profiles that vary with time. FMS Software Data Explorer also supports exporting query results to CSV file format for use with external applications, such as Microsoft® Excel®, and exporting query results as a self-contained, compressed dataset for sending by e-mail or transferring to another computer.

**FMS Software Data Converter**—Module for converting DTS data stored in the FMS software native formats to other standard formats, such as CSV and WITSML, for use in other applications, such as Microsoft Excel and Schlumberger THERMA\* thermal modeling and analysis software for DTS wells.

**FMS Software Schematic Editor**—Functionality that allows users to create integrated to-scale asset schematics for use as illustrations or overlays in profile visualizations.

**FMS Software Automation Console**—Module for creating scheduled tasks that can be run manually or automatically. The application provides a way to automate maintenance tasks that would otherwise have to be performed manually, such as data backup, data purge, data conversion, file movement, and clock synchronization.

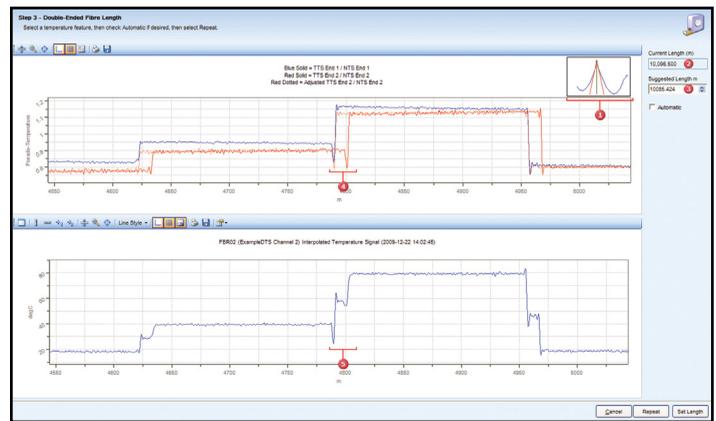
**FMS Software Support Tools**—Tools to make collected DTS data more accessible and user-friendly. Most support tools are integrated with Windows® Explorer®, support drag-and-drop, and run as stand-alone applications. They include

- FMS Software Profiles Player
- FMS Software Profiles Viewer 2D
- FMS Software Profiles Viewer 3D
- FMS Software Values Viewer
- FMS Software Dataset Viewer.

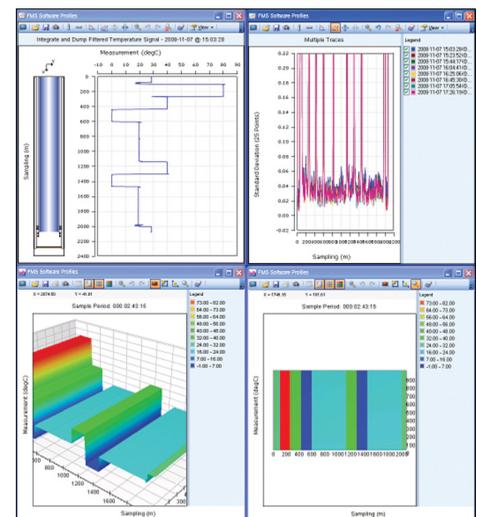
**Data delivery**—Options for data delivery, which vary depending on the application. FMS software accommodates the wide range of requirements with an equally wide range of options.

**Data management**—Options for defining assets along the length of the fiber, allowing key areas of interest to be separately saved and reviewed.

**LAS editor**—Editor for viewing and creating Log ASCII Standard (LAS) files.



Fiber length is a critical parameter when a double-ended DTS measurement is set up. FMS software semi-automates key stages of the DTS commissioning to help ensure the most accurate setup. The figure shows two initial temperature profiles (top) from an estimated fiber length that, when combined, provide a composite profile (bottom). The software reviews the data and suggests an adjusted fiber length that provides a more accurate temperature measurement.



FMS software allows multiple pop-up chart windows to be tiled on the screen for comparisons.

### Computer requirements

The minimum hardware recommendations for the acquisition computer are as follows:

- Intel® Core™, Duo 2.00 GHz processor
- 1 GB memory (minimum), 2 GB recommended
- Super VGA graphics with 1280 × 1024 resolution, 256 MB cache with OpenGL® support
- 1 × 10/100 MB Ethernet card. An additional card is required for external connectivity.

[slb.com/WellWatcher](http://slb.com/WellWatcher)

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