STEX Pro Software

The intelligent solution for laboratory-based seismic qualification and simulation

POWERFUL **STEX PRO SOFTWARE** LEVERAGES INDUSTRY-LEADING MTS REMOTE PARAMETER CONTROL™ TECHNOLOGY FOR CONDUCTING HIGHLY ACCURATE AND REPEATABLE SEISMIC QUALIFICATION TEST AND EARTHQUAKE SIMULATIONS ON LARGE-SCALE CIVIL STRUCTURES, SUBSTRUCTURES AND NON-STRUCTURAL EQUIPMENT AND SYSTEMS.

Optimize Seismic Qualification and Simulation

STEX (Seismic Test Execution) Pro software is the ultimate tool for setting up and performing laboratory-based seismic qualification tests and earthquake simulations on large-scale civil structures, substructures and non-structural equipment and systems. It combines a host of innovative seismic simulation tools with an integrated suite of applications for achieving precise control of complex, multi-channel mechanical test systems.

STEX Pro software employs an iterative process to reproduce the accelerations, velocities and displacements of recorded time histories, and customer-defined profiles, on MTS mechanical test systems, enabling the quick and accurate replication of seismic events in controlled laboratory settings. The software can be used to support a broad array of MTS equipment, including standard uni- or biaxial seismic simulators, custom 6 DOF seismic simulators, multi-axial simulation tables (MAST™), multi-table combinations, and other custom civil structural configurations.

More Information for Your Effort

Mechanical testing costs money and takes time, so it is critical to extract as much information as possible from every test. Using advanced editing and analysis techniques, STEX Pro software optimizes simulations to maximize laboratory productivity and transform data into useful, functional information through advanced analysis, editing and reporting.

The process begins with the collection of information about the "real-world" operating environment through field-recorded data. During test modeling and simulation, information obtained through dynamic monitoring of the test article provides valuable, sometimes critical, information about the character of its performance. RPC laboratory testing lets engineers duplicate the environment to which structures, substructures, systems and equipment are subjected and observe the failures that occur.

Unmatched RPC® Technology

STEX Pro software leverages world-leading MTS Remote Parameter Control (RPC) software technology for data validation, analysis, laboratory simulation and test monitoring. It complements existing test system installations, providing:

- Advanced methods
- Intelligent seismic simulation tools
- Customizable, process-driven user interfaces
- Customization and automation capabilities to meet specific needs
- Unsurpassed control techniques and analysis functionality
- Powerful diagnostics

A Unique Synthesis of Leading Platforms

STEX Pro software represents a unique synthesis of two world-leading MTS software platforms, effectively blending the civil/seismic test and simulation functionality of proven STEX software with the powerful Remote Parameter Control technology that has made RPC Pro software a critical tool for ground vehicle designers worldwide. Developed in close collaboration with some of the world's premiere civil engineering laboratories, STEX Pro software will define the state-of-the-art for civil/seismic test and simulation for decades to come.

Benefits of Open Architecture

STEX Pro software lets users customize every aspect of the application, from definition of simulator attributes and specification of drive signals to pre- and post-processing analysis. The software's extensible design facilitates easy automation of user processes and its open architecture supports access to multiple computation engines such as Matlab.

Built-In Project Data Management

The software lets you automatically manage user data, log files and project information on a project-by-project basis, and delivers consistent operation and ease of use in a structured project format.

Seamless Controller Integration

STEX Pro software integrates seamlessly with MTS 469D and 793 controller products for quick configuration and easy use.

STEX Pro software is the ultimate tool for setting up and performing laboratory-based seismic qualification tests and earthquake simulations on large-scale civil structures (above), substructures and non-structural equipment and systems (below).

Process Automation Reduces Test Time

STEX Pro software automates the entire simulation process, simplifying use, ensuring consistent operation and allowing easy customization for specific test systems.

STEX Pro Software Helps You "Work Smarter"

With its robust, intelligent diagnostics, STEX Pro software simplifies every step of the process with:

- Push-button, process-focused applications
- Transparent data management
- Online signal display
- Predefined tests stored in customizable templates to test setup time, ensure consistency and reduce operator error

Solve Problems Quickly

The system's Interactive Simulation Desktop tools and processes help save time and money by identifying and addressing problems early in the simulation process. These tools include:

- Signal processing calculators
- Control band estimation
- Matrix Editor with automatic inverse views
- Channel transformation for easy input of user algorithms

Qualification & Seismic Simulation

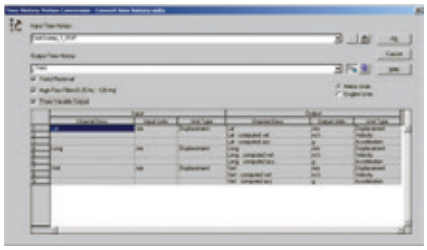
STEX Pro software, in conjunction with other MTS products, provides a comprehensive set of common application tools for seismic testing. These tool sets support enterprise-wide activities by providing better integration and easier sharing of simulation information across analytical and experimental activities.

Supported Windows® Operating Systems

- Windows XP Professional
- Windows 7 Professional 32 bit
- Windows 7 Professional 64 bit

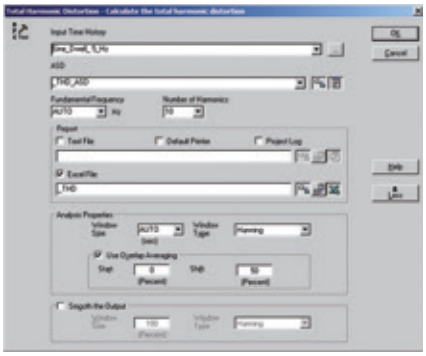
Innovative Seismic Simulation Tools

STEX Pro software features a diverse set of new simulation tools designed to help overcome structural and substructure testing challenges, and address emerging simulation needs for non structural equipment/system test specifications like AC156 and others. Some key components of this toolset include:



Time History Motion Conversion: used to convert time history motion data into other units of motion

» Automatically performs integration and differentiation to convert to/from acceleration, velocity and displacement motions, or all three variables, including conversion to English or Metric units.

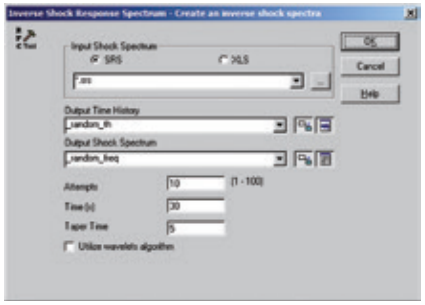


Total Harmonic Distortion: used to calculate the THD value from time history data and output to report format. This is useful when troubleshooting problems by assessing the magnitude of the harmonics of sine dwell signals.

Shock Response Spectrum (SRS): used to generate a shock response spectrum from an acceleration time history input

» Employed in Multi-axial Qualification Testing

- Bellcore Specification
- AC156 Specification (bank servers, hospital monitors, high-value building contents)
- IEE693 Specification (substation switch gear)



Inverse Shock Response Spectrum: used to convert SRS data into random time history output that can be used as a desired response for simulation

» Excite all structural resonances defined by SRS (including damping) using a simultaneous, multiaxial orthogonal algorithm to output random and wavelet time histories.

SRS Conversion: used to convert spectra data to or from a shock response spectrum

» Supports both RPC Matrix and Microsoft Excel formats

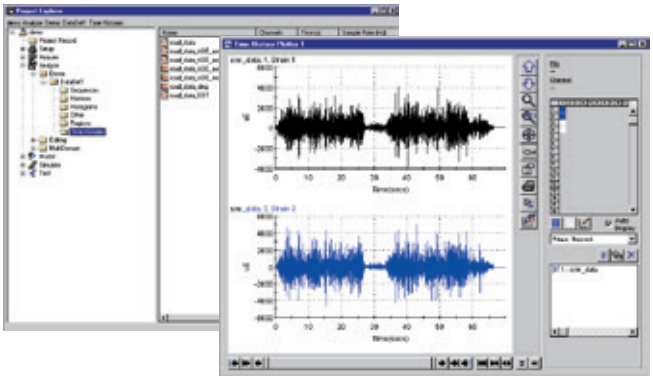
» Convert SRS to _SHP and use for FRF random excitation

» Create a _SHP per Bellcore or AC156 Qualification spec and convert to SRS and use as input to ISRS tool

Compress: used for testing of scale model buildings and structures

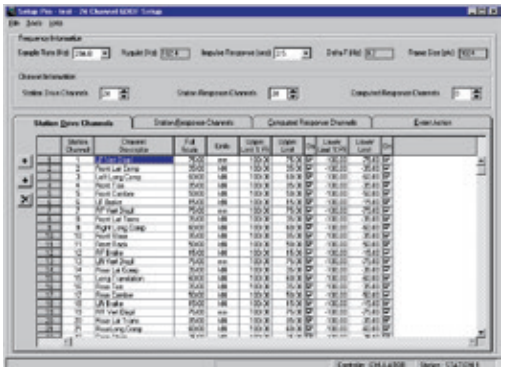
Project Manager

The Project Manager application is a required module. It is the foundation of the product, providing control of default settings and functioning as a launch pad for other STEX Pro applications.



Setup

The Setup application is used to specify test configurations, allowing the user to interactively define drive, response and online computed channels. It is required when using a simulator to play out drive files or acquire response data.



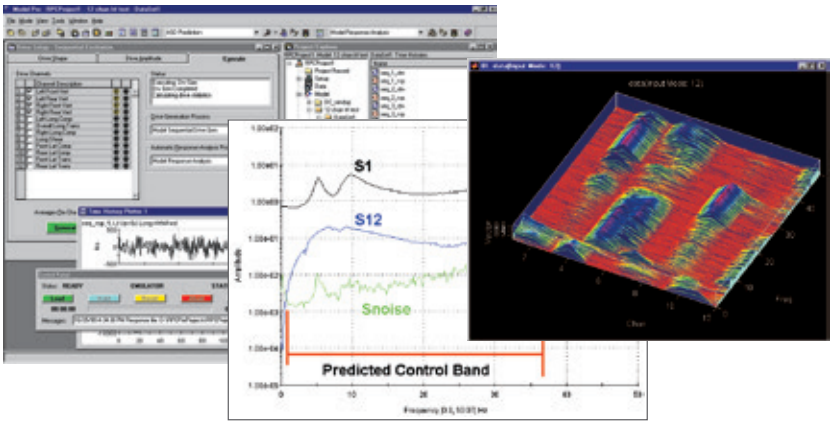
Acquire

The Acquire package provides an application for transferring data into STEX Pro projects.

Model

The Model application provides tools to generate simultaneous and sequential random drive files, calculate system models and generate inverse models. A variety of interactive diagnostic checks are incorporated into the Model application, including:

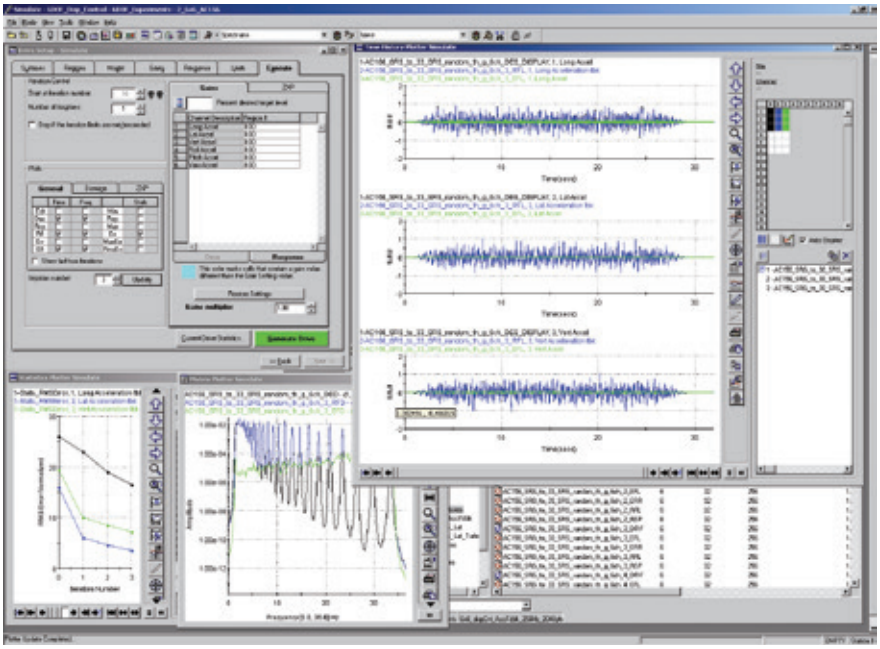
- Control band estimator
- Auto spectral density (ASD) prediction
- Coherence
- Engineering rank inverse
- Singular value decomposition



Simulate

The Simulate application provides an interactive environment for performing iterations. Iteration convergence criteria may be directly evaluated in all domains—time, spectral, statistical—while user-definable processes support further analysis of data. The user may define 0 – 100% target levels in Simulate to accommodate the Principal Investigator's analysis of structures during the simulation.

Simulate includes the adaptive inverse modeling control technique called Turbo RPC. This adapts the system model, represented by the inverse frequency response function (FRF), to changes—non-linearities and shifting resonance problems, for example—in the characteristics of the specimen during iterations. In already stable systems the Turbo RPC technique allows for less iteration to meet convergence criteria. However, the control technique also provides you with a tool for the challenges other control software is incapable of solving.



STEX Pro Licensing & Support

License Information

All STEX Pro packages include a highly flexible, network-based license manager. The number of licenses for each bundle and/or options will depend on your anticipated usage. This provides the ability to configure a system that specifically meets your needs. STEX Pro software is offered with both purchased and leased licenses for flexible management of capital resources.

Software Support Plan

MTS is committed to maintaining your STEX Pro software at peak performance. Our unique Software Support Plan (SSP) program will provide you with software at the latest technology level. The software will be regularly enhanced based on feedback from the hundreds of engineers using MTS simulation products on a daily basis.

Our SSP contracts provide a direct, priority technical support line. Our engineers help address challenges, and user input helps guide the future direction of the product. You will be provided with one year of coverage when you purchase your new STEX Pro licenses. As long as you keep your SSP contract current, you can renew it annually for a nominal fee. If you let the contract lapse, MTS has a "catch-up" program so you can renew coverage. MTS will provide you with software updates for the duration of the contract.

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For More Information

For more information on how STEX Pro software can optimize your laboratory-based seismic qualification and simulation program:

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