

TECH Notes

TriboScript Software Simplifies Tribological and Mechanical Test Procedures

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Bruker's UMT TriboLab™ universal materials testing platform utilizes advanced proprietary software to precisely control and operate its various modules to perform the world's widest range of intended tests. This complex software traditionally takes a bit of time to master. Bruker's new TriboScript™ user interface is designed to eliminate these initial complexities and makes test script handling easier, faster, and more intuitive for both first time users and experienced operators.

Script Writing

The UMT TriboLab system accommodates the handling of a wide variety of test protocols and operates numerous test modules. Moreover, it uniquely enables researchers and experienced users the flexibility to design and perform complicated, customized, and highly specialized testing tasks. It is difficult to operate such a vast system with a single software platform simply. To combat the learning curve and increase ease of use, Bruker has developed an offline software program to improve and simplify users' script handling in running tests with the TriboLab mechanical tester. The new TriboScript software utilizes a drag-and-drop methodology to prepare test scripts. Once created, the scripts are exported to the TriboLab system, and the tests are run. All of this is made much more intuitive and reliable through TriboScript.

TriboScript Software

TriboScript is used to prepare, edit, and finalize test scripts. The main window of TriboScript is presented in Figure 1. The ribbon control of the software contains three tabs: File, Home, and View. The File tab allows users to create, open, save, and exit out of scripts. Figure 2 shows the menu options in the File tab. The Home tab icons are mostly used for TriboScript operation, including File, Edit, Insert, Mode, and Options (see Figure 3). The Mode option allows categorical access to test script and recipe editing as either an expert or as an operator. Expert Mode provides complete access to all functions of TriboScript, and is password protected. Expert Mode allows for preparing a recipe or a block for a recipe that can perform a complicated task. On the other hand, Operator Mode keeps the recipe in a simple form by displaying only the bare minimum of options that are necessary for running the test. Operator Mode allows the user to change some test parameters, such as speed, load, time, etc., that are already partitioned during script preparation in the Expert Mode. Such a partitioned recipe is clean and easy for any operator or first-time user to run. The View tab is for setting up the visual appearance of the TriboScript window, including Theme, Language, and other parameters displayed in the Properties Pane. The Menu options of the View tab are shown in Figure 4.

TriboScript Major Features

TriboScript offers many testing advantages and a better user experience through a number of innovative features:

Block – A block is defined as a predefined collection of sequences and steps that are configured for a specific purpose. A user can create a new block or edit an existing block. Blocks are available in the Block Library. A user can click on the New icon in the ribbon control and select the New Custom Block option to open a new block in the designer area. The user can also right-click in the Block Library and select the Create New Block option from the context menu. Sequence and Steps can be added in the Advanced View. The user can also add Partitions and Exposed Properties in the Partitioned View. Editing the block enables the user to customize any predefined block for a specific purpose. Block editing can be performed from the Block Library or from a script. The user should be in Expert Mode for editing a block. The block icon, name, and description can all be edited in the block properties that are displayed in the Properties panel. A block can be deleted from the Block Library by selecting the Delete option in the Context menu. Exporting a Block enables a user to save a block as a file to be reused later. Any block in the Block Library can be exported by right-clicking on it and selecting Export Block from the Context menu and saving the block file through the save-file dialog. On the other hand, a user can import a block to the Block Library by selecting a block file, right-clicking on it, and selecting Import to Block Library from the Context menu.

Operator Mode – TriboScript offers Operator Mode as a default option, which allows a designed script to directly run a test on the TriboLab system. Although the script may allow a user to change its test parameters that are partitioned, most of the unnecessary menus of test and control parameters are unavailable in the Operator Mode. In this mode a user can: (a) create, open, or save scripts; (b) import and export blocks; (c) add blocks from the Block Library to a recipe; (d) view and edit the properties of a block; (e) view the partitions and exposed properties; and (f) edit the values of exposed properties.

Expert Mode for Script Writing – A test script can be designed in the Expert Mode from either an existing script or an existing block, or a new one can be created from scratch. The Expert Mode has all the bells and whistles required to prepare a complicated test script and is protected with a password. A user can switch to the Expert Mode by selecting this option in the ribbon control and entering the password. In addition to the functionalities found in Operator Mode, users can (a) view sequences and steps in the script; (b) view and edit properties of sequences and steps; (c) edit an existing block in the library or recipe; and (d) import a full script or a portion of a script. Block structures are the backbone of the script. It's easy to edit or modify blocks to shape a script to perform either very basic or even extremely complicated sets of operations to successfully complete intended tests. A user in Expert Mode can add a block to the design area by simply dragging and dropping from the Block Library. The Components

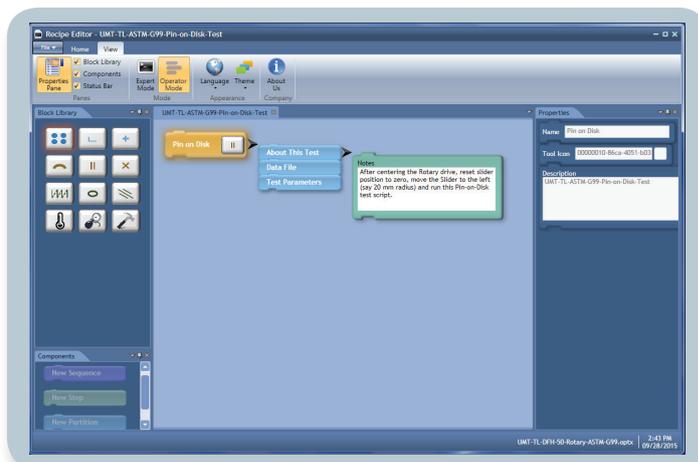


Figure 1. TriboScript window displaying a test script in Operator Mode.

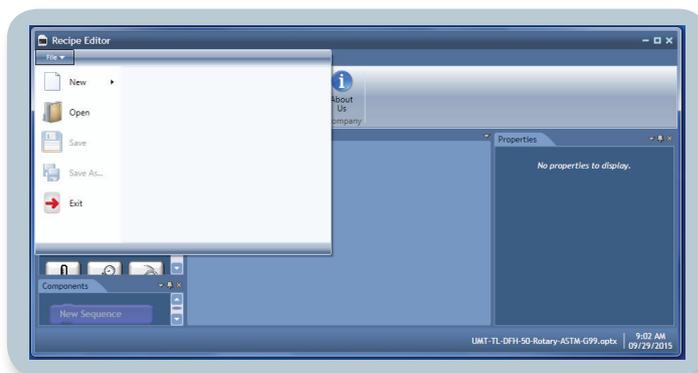


Figure 2. TriboScript window displaying the File tab menu.

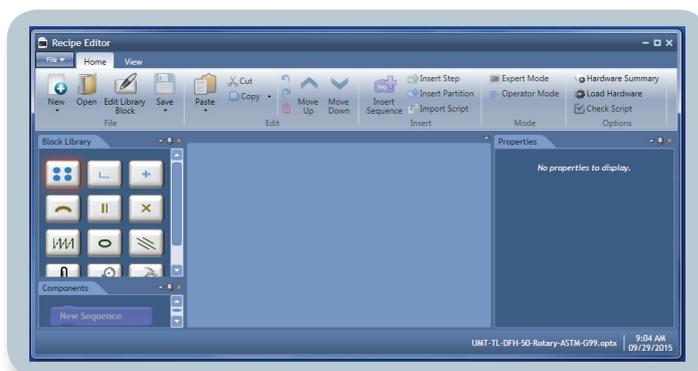


Figure 3. TriboScript window displaying the Home tab menu.

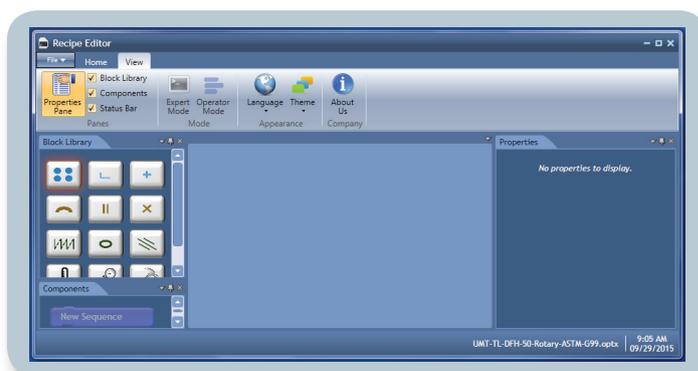


Figure 4. TriboScript window displaying the View tab menu.

panel is active only when the user is in the Designer Mode. It displays Sequence, Step, and Partition components that can be added to the design of a script by drag-and-drop procedure.

Designer Mode – Designer Mode is the most advanced mode in TriboScript applications. A user can get into Designer Mode by editing any block from the Block Library or from a script. To switch into Designer Mode, a user must be in the Expert Mode. In Designer Mode, a user can (a) insert sequences and steps to a block; (b) delete sequences and steps from a block; (c) add partitions to a block; (d) expose new properties to a partition; (e) view and edit properties of sequences and steps; (f) export the current block to a block file; (g) save the current block to the Block Library; and (h) import a script to the current block.

Partitioning of Test Script Parameters – Partitioning is a function that is available in Expert Mode and Designer Mode in the Component panel. This function helps simplify the script for the operator. It allows the designer to display only the most basic or relevant parameters needed to run a particular test. Partitioning shields other complicated options from the user, keeping the outer appearance of the script simple and clean.

Import Script – This feature provides the TriboScript Recipe Editor backward compatibility with the scripts that are created with UMT software. A user can achieve this by clicking on the Import Script icon in the ribbon control to display a file browser dialog. When the user selects the script file to be imported, a pop-up will appear from which a user can select the node or nodes to be imported to the current recipe/block.

Check Script – This functionality checks all the errors in the script file. It not only checks the integrity of the XML content of the script and hardware options, but also displays a dialog with details of the logical errors, if any.

Hardware Summary – A user can load hardware options files by clicking on the Load Hardware icon in the ribbon control. The user will be prompted to close all the open scripts before loading a new hardware options file. The name of the currently loaded option file is shown in the status bar. The hardware summary displays details of the hardware present in the options. The user should check the hardware summary to ensure that the script will work with the hardware on which it is written.

Standard Test Scripts Library – TriboScript software comes with a library of ASTM standard test scripts that are often used for tribological and mechanical testing of materials. These standard test scripts can be used in their existing form, though a user can also modify the partitioned test parameters in these scripts if desired.

Conclusions

Bruker's UMT TriboLab is an extremely advanced and capable universal tool for tribology and mechanical testing. It now comes complete with TriboScript software to enable better script writing. Expert Mode in TriboScript allows for experienced users to prepare scripts that can perform complicated or customized tasks, while keeping the original universal design intact. The Operator Mode has a very simple layout that can be used by any user and does not require knowledge of complicated script writing procedures. With TriboScript, scripting and performing tests with the TriboLab is now a simple and straightforward process regardless of the user's experience.

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