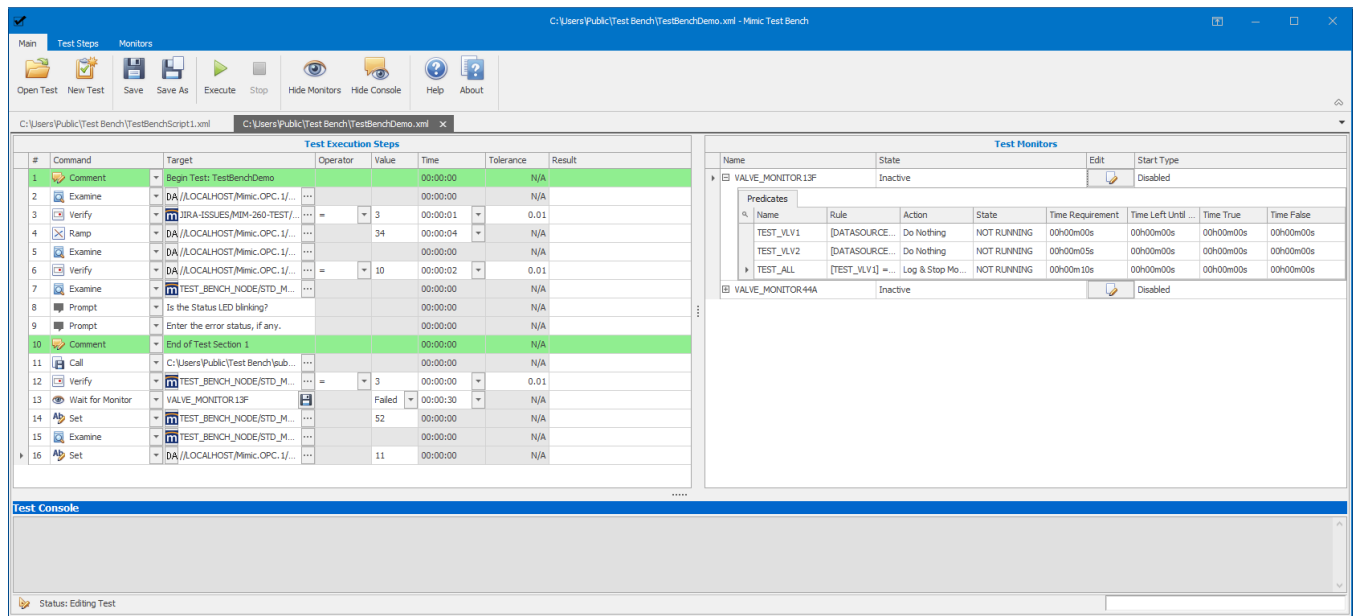


Mimic™ Test Bench



- Automate control system testing
- Improve testing consistency
- Automatically generate testing documentation
- Reduce control system testing time and cost
- Identify configuration regression errors

Introduction

Mimic Test Bench provides Mimic users a way to automate Integrated Control and Safety System (ICSS) configuration testing and document the testing of these systems. Users can create a test to set, examine, and verify values in both their Mimic simulation and any OPC compliant control system. These tests can be executed any number of times automatically and can even be launched via the command-line or by Windows as a scheduled task.

Benefits

Automate control system testing

Mimic Test Bench tests are easy to build, supporting an automated approach to control system testing and testing documentation development.

Improve testing consistency

Once a Test Bench test is developed, it can be run on all control modules, enforcing complete and consistent control system testing. Tests can be rerun as often as needed reducing configuration regression errors, resulting in ICSS configuration with less errors.

Automatically document testing

Test logs for each test are automatically saved providing a permanent record of the testing.

Reduce control system testing time and cost

Test Bench tests can be started from the user interface, via a command line, or as a regularly scheduled task. Tests can be repeated for all control modules without user intervention.

Identify configuration regression errors

Test Bench tests can be repeated after any control system configuration change, as an effective means of identifying and eliminating regression errors introduced in control system configuration changes.

Product Description

Mimic Test Bench is a software option allowing users to test ICSS configuration, integrated to Mimic and any ICSS control system that has an OPC Server. These tests can be executed either from the Test Bench application, using a command-line, or by scheduling an automated task in the Microsoft Windows operating system. After executing tests, log reports can be saved providing a permanent record of the system test.

Test Commands

Tests consist of a series of commands that are executed in order. The test commands are read/write requests to Mimic Simulation Models or any OPC-compliant control system control modules.

Command	Description
Set	Write a specific value to a Mimic or OPC tag
Ramp	Transition a Mimic or OPC tag from its initial value to a target value over a set period
Pause	Delay test execution for a set period before continuing
Wait	Delay test execution until a condition is met or a time-out elapses
Verify	Write a message to the log indicating whether a specific condition is true at that point in the test
Examine	Write the value of a Mimic or OPC tag to the log.
Prompt	Display a message box and wait for the user to dismiss it before continuing execution of the test.

Start Monitor	Initialize a Test Monitor and begin assessing its Predicates
Wait for	Pause test execution until the Target Test
Monitor	Monitor reaches a desired state (e.g. Failed, Inactive, Running) or the period configured in the Time field elapses

For each command in a test, there are five different parameters that are used to define the commands. But not every command uses all parameters.

Parameter	Description
Command	The action to be executed by Test Bench
Target	A data source (e.g., Mimic Block Reference, OPC DA Item, etc.) to be read from or written to
Operator	Specifies a comparison between the tag value, and the Value parameter
Value	A numeric value to be written or compared against
Time	The length of time the command may take
Tolerance	User-configurable margin used during conditional checks

Set Command

Target: Specifies the data path and data source type (e.g. Mimic Block Reference, OPC DA Item, etc.) to be written to.

Value: The value to write to the Target.

Ramp Command

Target: Specifies the data path and data source type to be written to.

Value: The final value to write to the tag.

Time: The amount of time to take transitioning the tag from its initial value to the final value.

Pause Command

Time: The amount of time before executing the next test step.

Wait Command

Target: Specifies the data path and data source type to be examined during the Time period.

Operator: The comparison between the Tag and the Value.

Value: The right-hand value to compare the Tag against.

Time: The maximum amount of time to spend waiting for the condition to be met.

Verify Command

Target: Specifies the data path and data source type to be verified.

Operator: The comparison between the Tag and the Value.

Start Monitor Command

Target: The Monitor to be initialized and activated.

Value: The right-hand value to compare the tag against.

Time: The maximum amount of time to spend waiting for the condition to be met.

Wait For Monitor Command

Target: The Monitor whose state will be examined and compared to the goal state configured in the Value field.

Value: The goal state for the Target Monitor.

Time: The maximum amount of time waiting for the Target Monitor to reach its goal state.

Examine Command

Target: Specifies the data path and data source type to be retrieved and logged.

Prompt Command

Target: The text to display to the user.

Editing ICSS Configuration Tests

The Mimic Test Bench application allows multiple tests to be loaded, edited, and run at the same time. The name of the test is displayed in the banner of the individual test window

Tests Steps are displayed in the Test Execution Steps grid. Commands or parameters can be modified directly in the grid, and new Test Steps are appended to the Test Script using the New Test Step button.

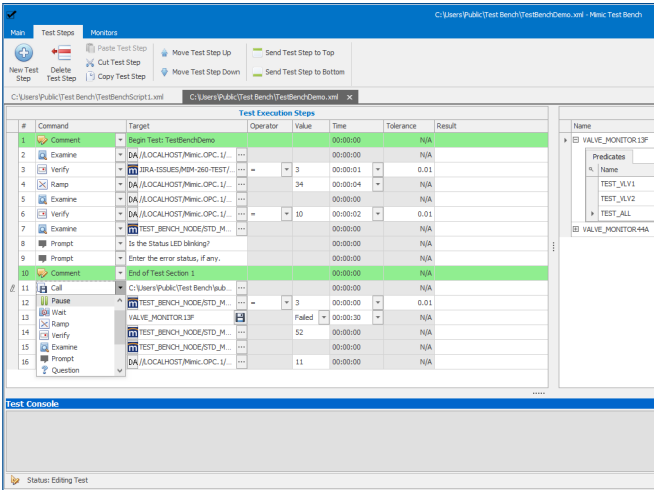


Figure 1: Editing a Test Step using the Test Execution Steps grid.

Standard clipboard commands (cut, copy and paste), a delete command, and commands to move steps up and down the script are available, allowing easier test creation or modification.

Executing ICSS Tests

Once the tests are built, they can be executed via the Execute command on the Test menu or the toolbar. The Execute command will launch a dialog allowing you to specify the parameters for the test.

Test Monitors

Test Monitors allow the user to define data relationships in the ICSS configuration that are continually evaluated during a test. Test Monitors contain a list of user-defined Predicates. Each Predicate contains a rule that represents a data condition that the user would like to verify and an action that will be taken if that rule has found to have been violated. Monitors are evaluated constantly, in parallel with the Test Execution Steps. The state of the predicate, (Passing, Pending Failure, Failure) updates in real time, triggering various Actions.

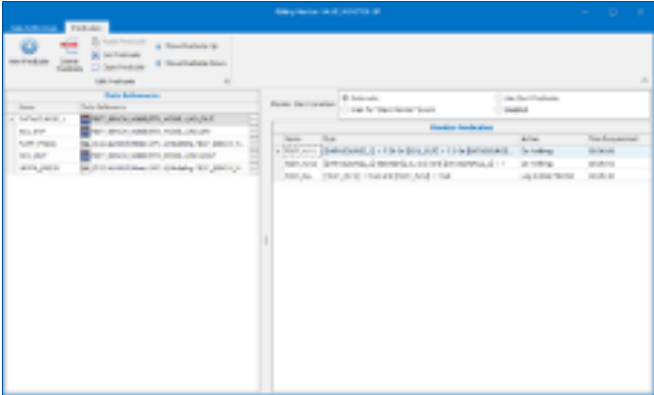


Figure 2: Configuring a Test Monitor by creating OPC and Mimic Data References and declaring Predicates which will continuously examine runtime conditions and perform various Actions if their Rules have been violated.

Monitors can be edited in Test Bench by clicking the edit button in the Test Monitors Grid. This provides a central location to define what data should be used to develop the rules Data References have user-defined names, which allows them to be directly referenced in Predicate Rules. Predicate Rules take the form of a conditional statement. The Predicate Rule Editor provides the user with a graphical tool for creating simple and complex conditions.

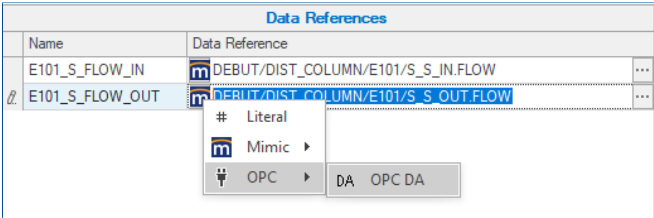


Figure 3: Creating a Data Reference using the Data Reference editor, a new all-in-one control for quickly browsing OPC and Mimic parameters

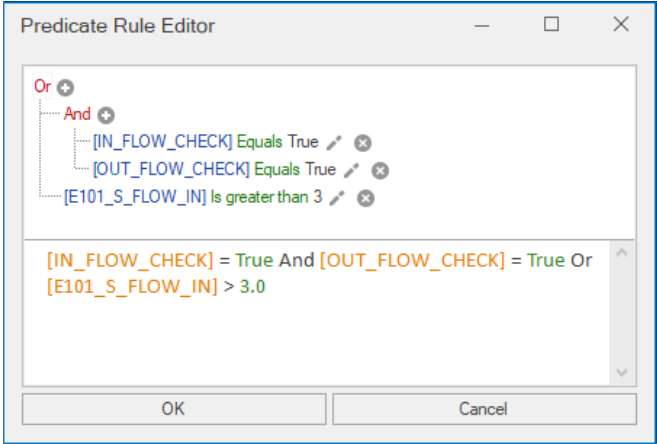


Figure 4: Using the graphical Predicate Rule Editor to configure a Predicate Rule that will validate a complex runtime condition.

Monitors and Predicates can govern the execution of a Test that provide flexibility using the Test Execution Steps and Monitors. Examples of this flexibility and enhanced testing:

- *Monitors run only during a specific part of the test.* Declare the Monitor with the “Wait for ‘Start Monitor’ Command’ Start Type. Then, place a Start Monitor command anywhere in the Test Execution Steps. When this command is reached, the Monitor will be brought online.
- *Test is paused until a Monitor reaches a certain state.* Use the Wait for Monitor command to ensure that a Monitor reaches a goal state (such as Inactive, Failed, or Running) before continuing test execution.
- *Fail a test if a Predicate fails.* Use the “Log & Stop Test” Predicate Action, which will end test execution immediately after the Predicate fails.

☒ Execute Test

Number of Passes

☒ Fixed: 1

☐ Continuous Passes

Test Steps to Execute

☐ Begin at Step: 1

☐ Quit After Step: 16

Monitors

☐ Don't Run Monitors

☒ Run Monitors

OPC

☐ Synchronous IO

☒ Asynchronous IO

Logging

☒ Log results to a file ☐ Concise

File Name: C:\Users\Public\Test Bench\TestBenchC Browse...

?

Execute

Cancel

Figure 5: Configuring the conditions under which we will execute a test. Choose where to log results, elect to run Test Monitors, and more.

Ordering Information

Mimic Test Bench is an optional package to the Mimic base software license that can be purchased when ordering the base license or as a later addition. To purchase the Mimic Test Bench license, the base Mimic package must be current on Mimic Software Support.

Description	Model Number
Mimic Test Bench	MM3-3103

Emerson
North America, Latin America:
☎ +1 800 833 8314 or
☎ +1 512 832 3774

Asia Pacific:
☎ +65 6777 8211

Europe, Middle East:
☎ +41 41 768 6111

🌐 www.emerson.com/mimic

©2020, Emerson. All rights reserved.

The Emerson logo is a trademark and service mark of Emerson Electric Co. All other marks are the property of their respective owners.

The contents of this publication are presented for informational purposes only, and while diligent efforts were made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. All sales are governed by our terms and conditions, which are available on request. We reserve the right to modify or improve the designs or specifications of our products at any time without notice.

