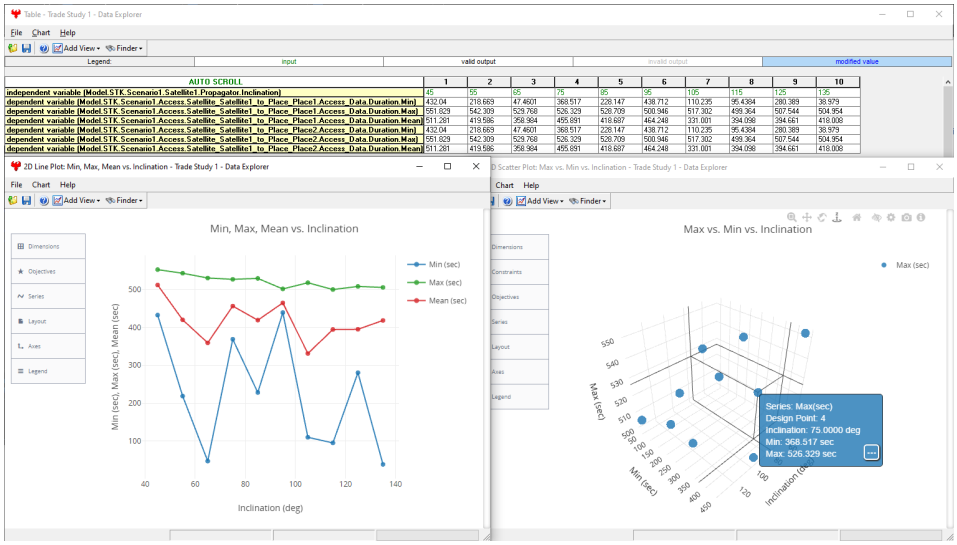
STK ANALYZER

STK Analyzer is integrated into the STK workflow to help you automate and analyze STK trade studies to better understand the design of your system.

Analyzer is a fully integrated, STK add-on module that:

- Blends engineering analysis capabilities of ModelCenter® (Phoenix Integration Inc.) with STK.
- Enables you to perform analyses in STK easily without involving programming or scripting.
- Introduces trade study and post-processing capabilities.
- Can be used with all STK scenarios, including those with STK Astrogator satellites.
- Fully supports Mutlfunction Radar (MFR) objects in Analyzer studies.
- Supports many Aviator features in Analyzer studies.
- Computes trade studies in parallel with the STK Parallel Computing Server.



Analyzer analysis tools

- **Parametric study**. Varies one item over a range to study the effects on various figures of merit defining performance.
- **Carpet plot**. Varies two items over ranges to study the resultant behavior of another parameter.
- **Design of experiments**. Varies multiple parameters creating a table of runs using various design type algorithms to study the effects on various parameters.
- **Probabilistic analysis**. Runs studies in Monte Carlo fashion. Output data can be analyzed and presented in histogram fashion.
- **Optimizer**. A separate extension that provides additional optimization algorithms to Analyzer.

Gradient-based optimizer

Local search for optima in problems with smooth, continuously varying objective and constraint functions.

Optimizer

The Optimizer extension for STK Analyzer extends Analyzer's parametric analysis capabilities:

- Adds three different optimization algorithms to the four existing parametric analyses offered with Analyzer.
- Features two design tools for further trade space exploration and parametric analysis insight.

Adaptive Surrogate optimizer

Part of Boeing's Design Explorer software, the Adaptive Surrogate Optimizer solves complex problems characterized by long-running analyses.

- Intelligently uses non-physics-based mathematical models (Kriging models) to reduce the number of required scenario executions.
- As a global search algorithm, it is not likely to get stuck in local optima.
- Performs well in noisy design spaces and is robust in the face of scenario failures.

Darwin Genetic optimizer

Darwin Genetic algorithms are ideally suited for design problems with discretely valued design variables (e.g., integer variables).

Because they do not require objective or constraint gradient information, genetic algorithms effectively search discontinuous and "noisy" design spaces.

Variable Influence profiler

The Variable Influence profiler enables you to gain a better understanding of variable relationships and overall design trends.

- Performs sensitivity analysis on a scenario.
- Encourages a more effective design problem formation and location.
- Provides more accurate optimization results.
- Generates variable importance plots that illustrate the relative impact of selected parameters on a scenario.

- Generates main and interaction effects plots that significantly reduces the complexity of the design task.

Prediction profiler

Interactively explores the design space, enabling you to.

- Efficiently predict output variable values for any combination of input variables.
- Visualize slices of the resulting /n/-dimensional design space (including the effects of constraints).
- Manually explore and search the design space for good designs.

This tool can be used to locate good designs, find good starting points for a more formal optimization algorithm, or visualize the design space around an optimum point generated by an optimization algorithm.