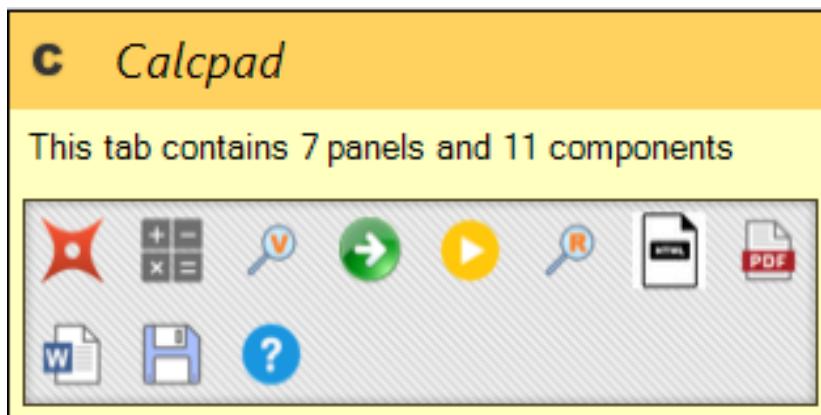


## GH\_CALCPAD

Calcpad, developed by *Proektsoftbg*, is free software for mathematical and engineering calculations. It is a modern and flexible programmable calculator with HTML report generation. It combines ease of use with advanced features such as consistent unit handling, explicit variables (?{...}), a clear worksheet structure, and formatted export.

GH\_Calcpad (V1.2.0) is a Grasshopper plugin that embeds Calcpad as a computation engine inside parametric workflows, adding optimization capabilities. It currently supports loading and executing .cpd sheets, selective variable modification, real-time execution, filtered result extraction, multi-objective optimization, and professional export to HTML, PDF, and Word.



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-  Information & Diagnostics
  - └ Info
-  File Loading
  - └ Load CPD
-  Variable Modification
  - └ Search Variables
-  Execution & Optimization
  - └ Play CPD
  - └ Optimizer
-  Result Filtering
  - └ Search Results
-  Saving & Export
  - └ Save CPD
  - └ Export HTML
  - └ Export PDF
  - └ Export Word
-  Help & Support
  - └ Help

  
[Download Calcpad](#)  
[Download GH\\_Calcpad](#)

 GitHub  
Visited:

Calcpad

GH\_Calcpad

## 1. INSTALLATION

### Prerequisites:

- Rhino 8 with Grasshopper
- Calcpad installed (optional but recommended to validate .cpd sheets)
- .NET Framework 4.8 (normally already present on Windows)

### Steps

#### 1. Download

Go to: <https://www.food4rhino.com/en/app/calcpad> and download the GH\_Calcpad ZIP.

#### 2. Extract

Unzip the file. Keep the GH\_Calcpad folder structure intact (do not move DLLs out).

#### 3. Copy to the Grasshopper components directory

Copy the entire GH\_Calcpad folder to:

C:\Users\YOUR\_USER\AppData\Roaming\Grasshopper\Libraries

(You can open this path from Grasshopper via: [File > Special Folders > Components Folder](#)).

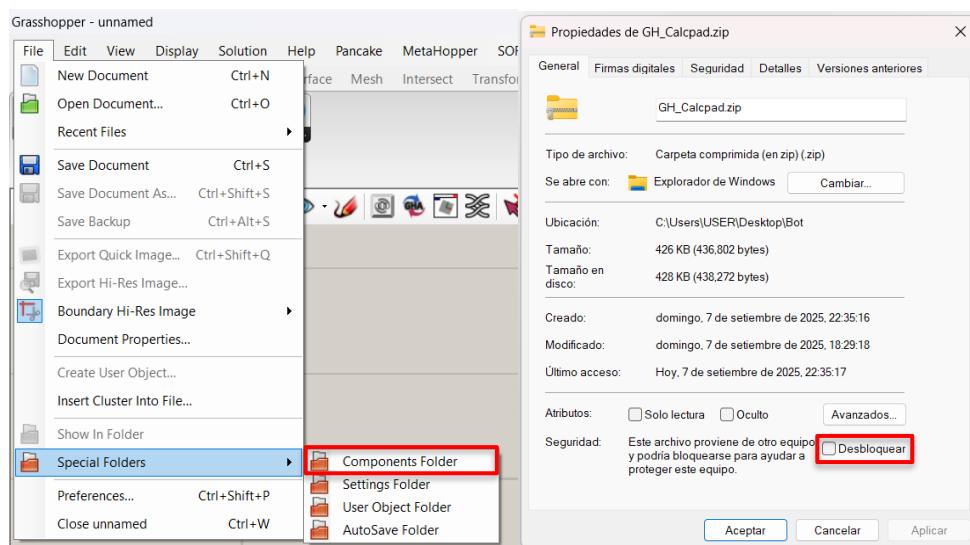
#### 4. Restart Rhino

Close Rhino (if it was open) and launch it again. Then open Grasshopper.

#### 5. Quick verification

The "Calcpad" tab should appear. Test:

- Place "Load CPD"
- Provide a valid .cpd file path
- Add "Play CPD" → results should be generated.



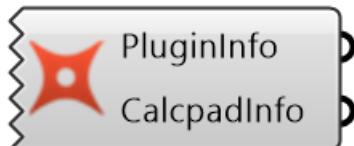
### Notes:

- If the tab does not appear (rare case), check file properties of GH\_Calcpad.gha / DLLs to see if Windows blocked them (Unblock option).
- Do not rename the .gha or the associated DLLs.

## 2. COMPONENTS GH\_CALCPAD

### a. Calcpad\_Info

Plugin information panel. Displays the plugin version and Calcpad.Core version with license information.



**INPUTS:**

- (none)

**OUTPUTS:**

- PluginInfo: Item · string – GH\_Calcpad plugin version
- CalcpadInfo: Item · string – Calcpad.Core version and license information

### b. LOAD\_CPD

Reads .cpd (plain-text) calculation files. Extracts variables, values, and units with automatic file monitoring.



**INPUTS:**

- FilePath: full path to the .cpd file
- CaptureExplicit: if true, only captures explicit format variables (default = false)

**OUTPUTS:**

- Variables: names of all variables found
- Values: numeric values, 1:1 with Variables
- Units: units, 1:1 with Variables
- SheetObj: CalcpadSheet instance for other components

### c. SEARCH\_VARIABLES

Filters and modifies specific variables while maintaining complete structure for perfect integration with Play CPD.



## **INPUTS:**

- **All Names:** complete list of variable names (from Load CPD)
  - **All Values:** complete list of variable values (from Load CPD)
  - **Filter Names:** names of specific variables to modify
  - **New Values:** new values for filtered variables (1:1 order with Filter Names)

### ***OUTPUTS:***

- **All Values:** complete array of values with modifications applied → connect to Play CPD
  - **Modified Names:** names of variables that were modified successfully
  - **Modified Values:** corresponding modified values (for visualization/debug)
  - **Not Found:** requested variables that were not found

**d. PLAY**

Main calculation engine. Executes calculations with optional variable override and performance monitoring.



### **INPUTS:**

- **Values**: new values for variables (1:1 order with SheetObj Variables), optional
  - **SheetObj**: CalcPadSheet from Load components

### ***OUTPUTS:***

- **ResultEq**: result equations in 'Name=(...)' format
  - **ResultVal**: numeric results, 1:1 with ResultEq
  - **Units**: units of final results
  - **Elapsed**: calculation time in milliseconds
  - **Success**: true if calculation successful
  - **UpdatedSheet**: updated CalcpadSheet for export components

## e. OPTIMIZER

AI-powered optimization component with auto-detection capabilities and intelligent caching.



### **INPUTS:**

- Sheet Object: CalcpadSheet from Load CPD
- Design Variables: variables to optimize (auto-detected if empty), optional
- Variable Values: current values from optimizer (Galapagos input)
- Objective Names: variables to minimize/maximize (auto-detected if empty), optional
- Optimization Mode: minimize/maximize/target per objective, optional
- Target Values: target values for 'target' mode, optional

### **OUTPUTS:**

- Fitness: single fitness value for optimizer (lower = better)
- Objective Values: individual values for each objective
- Status: calculation status and convergence information
- Iteration: current iteration number
- Best Fitness: best fitness found so far
- Suggested Variables: auto-detected variables for optimization
- Convergence Info: progress analysis and recommendations

## f. SEARCH\_RESULTS

Filters specific results from calculation outputs for focused post-calculation analysis.



### **INPUTS:**

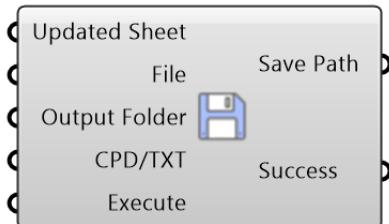
- Result Equations: complete list of result equations (from Play CPD)
- Result Values: complete list of result values (from Play CPD)
- Filter Names: specific variable names to extract from results

### **OUTPUTS:**

- Filtered Equations: equations that match Filter Names
- Filtered Values: values corresponding to filtered equations
- Found Names: variables that were successfully found
- Not Found: requested variables not found in results

## g. SAVE\_CPD

Saves modified CPD/TXT files with controlled execution and flexible naming.



### **INPUTS:**

- **Updated Sheet:** CalcpadSheet from Play CPD with modifications
- **File:** base name (without extension), optional
- **Output Folder:** destination folder path, optional
- **CPD/TXT:** false = .cpd (default), true = .txt, optional
- **Execute:** true = save (default = false)

### **OUTPUTS:**

- **Save Path:** complete path of the saved file
- **Success:** true if file was saved successfully

## h. EXPORT\_HTML

Exports HTML reports using Calcpad's native Convert engine with controlled execution.



### **INPUTS:**

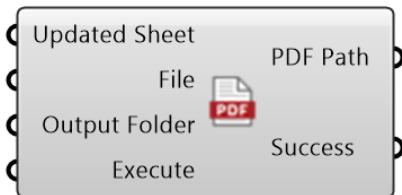
- **Updated Sheet:** calculated CalcpadSheet (from Play CPD)
- **File:** base name (without extension), optional
- **Output Folder:** destination folder, optional
- **Execute:** true = export (default = false)

### **OUTPUTS:**

- **HTML Path:** path of the generated .html file
- **Success:** true if .html was generated

### i. EXPORT\_PDF

Generates professional PDF reports using Calcpad's native export engine with controlled execution.



#### **INPUTS:**

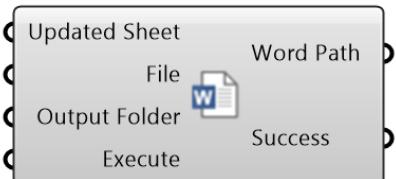
- **Updated Sheet:** calculated CalcpadSheet (from Play CPD)
- **File:** base name (without extension), optional
- **Output Folder:** destination folder, optional
- **Execute:** true = export (default = false)

#### **OUTPUTS:**

- **PDF Path:** path of the generated PDF file
- **Success:** true if PDF was generated

### j. EXPORT\_WORD

Exports editable Word documents using multiple conversion methods with controlled execution.



#### **INPUTS:**

- **Updated Sheet:** calculated CalcpadSheet (from Play CPD)
- **File:** base name (without extension), optional
- **Output Folder:** destination folder, optional
- **Execute:** true = export (default = false)

#### **OUTPUTS:**

- **Word Path:** path of the generated .docx file
- **Success:** true if .docx was generated

## k. HELP

Interactive help system providing workflow guidance and best practices for the GH\_Calcpad ecosystem.



### **INPUTS:**

- (none)

### **OUTPUTS:**

- **Workflow:** step-by-step workflow guide
- **ComponentGuide:** description of each component and purpose
- **BestPractices:** best practices and usage tips
- **Examples:** common usage examples and scenarios

## **3. WORKFLOW INTEGRATION**

### **BASIC WORKFLOW:**

Load CPD → Play → Export

### **ADVANCED WORKFLOW:**

Load CPD → Search Variables → Play → Search Results → Save/Export

### **OPTIMIZATION WORKFLOW:**

Load CPD → Optimizer → Galapagos → Save/Export

### **COMPLETE PARAMETRIC WORKFLOW:**

Load CPD → Search Variables → Play → Search Results → Save CPD → Export PDF/Word