

GrafiCalc Key Features

GrafiCalc 2011 includes facilities that have been enhanced over 15 years to incorporate latest computing technology and valuable inputs from users.

User sensitive facilities

- Automatic unit checking and conversion
- Continuous discrete prompts for tools and commands
- Double precision floating point accuracy – accurate to ten decimal places
- Mouse controlled Pan and Zoom
- Multiple documentation interface (MDI) for simultaneous display of multiple worksheets
- Multiple level user definable (up to 1000 steps) Undo/Redo capability
- On-line help and tips
- User definable units library
- Work with inch and metric units, as well as user defined unit system
- Right mouse controlled tolerance allocation
- Value generator for constraining geometry through a range
- Automatic transient data collection and tabulation
- Automatic Monte Carlo statistical analysis
- Trace function to create motion envelopes

Sketching tools

Initial geometry can be entered within GrafiCalc as well as imported from any DXF compliant CAD software using the built-in 2-way automatic translator.

Constraint manager: GrafiCalc includes an ultra-fast constraint manager especially tailored for function modeling. The powerful point and click constraint manager can resolve virtually unlimited number of circularities. It tracks original design intents to automatically resolve plural solutions.

Geometry definition tools: Line, Circle, Arc, Poly Line, Closed Boundary. Array operations – mirror, copy, translate.

Constraint tools: Free point, Concentric, Centroid, Endpoint, Proportional, Tangent, Intersection, Virtual Intersection, On-Entity/Slider, Parallel, Perpendicular, and at a fixed angle with respect to another line.

Automatic Constraint inference: GrafiCalc includes an automatic constraint inference facility which, when turned on, allows you to snap automatically to center, endpoints, tangents, centroid, and on-geometry automatically. Lines snap automatically to horizontal and vertical.

Text tool: Allows entering notes and annotations. Use all available fonts in your computer.

View manipulation tools: Pan, Zoom, Zoom by 2X, Zoom by .5X, Zoom to fit, Show paper boundary.

Automatic measurements

GrafiCalc incorporates linear, radial, and angular dimensions that can be constrained to measure any aspect of the flexible model. The measurements are updated automatically as design intents are altered. The measurements can be directly included in calculations setup in GrafiCalc Formula bar.

Calculations facilities

Formula Bar: GrafiCalc incorporates a “point and click” Excel type Formula bar that is used to establish bi-directional association between geometry, dimension, values, and calculations.

Programmable geometrical calculators: GrafiCalc includes a programmable calculation facility that enables users to setup multi-line $x = f(y)$ type of calculations. Dimensions and geometrical values can be directly incorporated in the calculation statements that are checked for unit integrity on a line by line-by-line basis. If and Else statements are supported. Multiple calculations can be combined. Results are used for developing calculation driven geometry. Calculation statements and answers can be copied into the Windows clipboard for pasting into technical reports.

Built-in calculation functions: GrafiCalc includes a library of 88 built-in functions to setup in the Formula bar and the Programmable calculator.

Note: Complete built-in function listing is available at the end of this page.

Macro driven design: GrafiCalc includes $x=f(y)$ type of programmable calculation facility that can be used to define calculation macros with bi-directional links to geometry and dimensions in the function model. Multiple macros can call each other. You can use the calculations macros to define validated standard calculations.

Automatic backsolving (Goal Seek)

GrafiCalc allows users to stipulated any measured or calculated value as design target and then have the computer Goal Seek the characteristics of any geometry that participates in the result until the actual value of the measurement or the calculated value is equal to the stipulated target value.

Excel connection

GrafiCalc is self-contained software that can be used standalone as well as a companion to Microsoft Excel. GrafiCalc supports Windows standard Dynamic Data Exchange (DDE) protocol. You can define GrafiCalc calculation macros to drive Excel calculations. You can also link any dimension in GrafiCalc to any cell in Excel. Conversely you can use Excel to control any attribute of any geometry in GrafiCalc.

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Motion simulation and analysis

GrafiCalc includes a value generator facility that can be used to setup the start value, increment value and the number of iterations. The Value generator can be used to drive any freedom of any geometry in the function model to simulate any imaginable motion behavior. Any imaginable 4-bar mechanism can be synthesized automatically. You can trace the path of any selected point. Multiple traces can be connected to define motion envelopes. You can automatically collect the transient values in any dimension and calculation results in a table format in Windows clipboard for analysis using Excel.

Tolerance analysis

You can assign tolerances to any freedom of any geometry in the function model. You can assign Polar tolerance to location of any point. Then you can perform powerful Monte Carlo statistical analysis of value contained in any calculation result or dimension that you can apply as electronic calipers to measure 1D and 2D relationships. Analysis results are available in seconds.

CAD connection

A 2-way DXF translator is available inside GrafiCalc that enables you to exchange geometry between GrafiCalc and all popular CAD applications in both directions.

Input Output

- Built-in 2-way DXF translator
- Print drawing directly from GrafiCalc
- Cut, copy, and paste information from GrafiCalc to Windows clipboard.
- Cut, copy, and paste information from Windows clipboard into GrafiCalc

System requirements

GrafiCalc is Vista enabled Windows standard application that can be used on any personal computer

Disc requirement

<2 MB

Built-in Functions Listing

Mathematical Functions

Alphanumeric Word
abs()
ANGLE(point_or_complex)
CEIL(number)
FLOOR(number)
DISTANCE(point_a,point_b)
E()
EXP(number)
I()
LN(number_or_complex)
LOG(number_or_complex)
MOD(number_a,number_b)
NOUNITS(value)
NROOT(number_or_complex,optional_nth,optional_ii)
PI
QUADRATIC(number_a,number_b,number_c,optional_number_ii)
RAND()Returns a random number between 0 and 1.
RANDOM(number_a,number_b)
ROUND(number_a,number_b)
SQRT(number_or_complex)

Geometry-associative Calculation Functions

Area
Distance of neutral axis to extreme fiber
Diameter
Moments a of Inertia
Polar Moment of Inertia
Product of Inertia
Radius of Gyration
Perimeter
Static Moment of Inertia
Centroid
Radius
Section Modulus
End or Endpoint
Included Angle
Length
Angle
Origin
Start Vector
Value
Vector

Statistical Functions

MAXIMUM(number_1,number_2,...)
MINIMUM(number_1,number_2,...)

Trigonometric Functions

ACOS(number)
ACOSH(number)
ASIN(number)
ASINH(number)
ATAN2(number_y,number_x)
COS(number)
COSH(number)
SIN(number)
SINH(number)
TAN(number)
TANH(number)

Point and vector Functions

HORIZONTAL()
Point
UNITIZE(point)
Vector Add
VECANG(number)
Vector Dot Product
Vector Subtract
Vector Return
VERTICAL()
point_or_complex.X
point_or_complex.Y

Control Functions

Choose
False
IF
Is Complex
Is Error
Is Geometry
Is Logical
Is Not Available
Is Number
Is Point
True

Binary Operators

A plus B, A minus B
A times B, A dot B, A divide B, A ratio B
A exponent B
A not equal B, A equal B etc.
A or B, A and B
Average

Unary Operations

A
~ A

Postfix Operators

A%

Textual Components

Comment
DDE Reference
Dot Field Operator
{geometry Tag}
Variable