## **Formulas in Macros**

CIMCO Edit5 Professional can now calculate and output values based upon a user input value. This has many uses and increases the power of the macro function.

Please copy Formulas.mac to C:\cimco\cimcoedit5\types. Start CIMCO Edit5 and select Formulas in the drop down list

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Ki Untitled	
NC-Assistant	Insert: Trig Functions
Description:	Parameters for 'Trig Functions'
	3, Input Value
	3.141593 PI
	0.5 Sine
	0.866025 Cosine
	0.57735 Tan
	0.0 Asine
	0.0 Acos
	88.090848 Atan
	534323729 Sinh
	534323729 Cosh
	1.0 Tanh
	1.477121 Log
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Feed and speed	
Drill death	5.477226 Square root
Spindle speed given css and diameter	m n
Degrees to Radians	3U Floor
Inches to mm	10 Sign
mm to Inches	1.0 Jign
Circle area	
Circle circumference	Default Cancel OK
Macro B Circle	
Degrees per minute given reedrate (Rotary only)	
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Degrees per minute for Linear with notary Axis motion	

The formulas are used much the same as variables, and are called @N as opposed to \$N, and allow the same formatting. To add a formula, enter the macro setup and press the "Add Formula button". Build your formula inside the {}

Example of Circle area calculation

@2{\$1\*\$1\*PI}

This Formula takes the user input value \$1 and multiples it by itself and then multiplies it by Pi.

The formulas supports \* / + - % (for modulus), nested expressions using () and the following trigonometric functions: abs,acos,asin,atan,cos,cosh,floor,In,Iog,sign,sin,sinh,sqrt,tan and tanh.

PI can be used instead of entering 3.1415.

Angles are in degrees

## Please use () for the input values in the trig functions eg sin(\$1)

If you only need to output the calculated value into the NC program include all your user input values inside the formula expression. When the Circle Area macro below is run only the @2 variable is output into the NC program

Macro Setup					? 🔀
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	Area=			3	~
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Add Rename T	Parameter is require Insert with sign Allow negative valu Do not insert empty	ed Ies lines	Allow letters <ul> <li>Remember value</li> <li>Uppercase</li> </ul>		
CIMCO Integration				(	OK

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NC-Assistant A	irea=314.159	
Modify	Parameters for Circle area  Parameters for Circle area  Parameters for Circle area  area  area  b = Optional parameter Default Cancel OK	
Cycles / Macros		
Ting Functions Feed and speed Dnil depth Degrees per minute Spindle speed given css and diameter Degrees to Radians Inches to mm MM to Inches		

You can choose to hide the results of the calculations on the macro dialog. This is a global setting and all your macros will not show the results on the dialog

Setup: General			? 💌
Setup: General General Colors Printing File types Colors Block numbers Load/Save File compare Machine Backplot CNC-Calc Other Global Colors External Commands Plugins	General         General program settings         Image:         Image: <t< th=""><th><ul> <li>Open file multiple times</li> <li>Show full path in title</li> <li>Specify name when receiving</li> <li>Always show all files (*.*)</li> <li>Re-open files</li> <li>Remember cursor position</li> <li>Confirm program exit</li> <li>Hide 'Download Latest Version'</li> <li>Show file size in:</li> <li>Show size in bytes</li> <li>Number of linefeed characters:</li> <li>Mazatrol Viewer Decimals:</li> <li>4</li> </ul></th><th></th></t<>	<ul> <li>Open file multiple times</li> <li>Show full path in title</li> <li>Specify name when receiving</li> <li>Always show all files (*.*)</li> <li>Re-open files</li> <li>Remember cursor position</li> <li>Confirm program exit</li> <li>Hide 'Download Latest Version'</li> <li>Show file size in:</li> <li>Show size in bytes</li> <li>Number of linefeed characters:</li> <li>Mazatrol Viewer Decimals:</li> <li>4</li> </ul>	
	Help	Default Cancel	OK

Here is a macro with the results being shown

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	💈 👎 🐺 🚥 💂 🋐 🖄 LATHE Spindle speed given CSS and Diameter 🕞 🔍 🤗 🛄 🖆 💂
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Unbiled *	
CSS=50. (meters/min) DIA=5(mm) FEED=.5(mm/rev) SPEED=3183. (rev/min) FEED=1591.5(mm/min)	Insert: LATHE Spindle speed given CSS and Diameter  Parameters for 'LATHE Spindle speed given CSS and Diameter'  *  O CSS (G96 meters/min)  *  5 Diameter (mm)  5 Feed rate (G98 mm/rev)  3183 Spindel Speed Formula variables being 1591.5 FEED(mm/min)  *  O Concel DK

This is the same macro without the results being shown. The output is the same in the NC file but the dialog does not show the calculated values. This can be useful if you have many calculated values in the macro.

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CSS=50.(meters/min) DIA=5(mm) FEED=.5(mm/rev) SPEED=3183.(rev/min) FEED=1591.5(mm/min)	Insert: LATHE Spindle speed given CSS and Diameter Parameters for 'LATHE Spindle speed given CSS and Diameter'  Parameters for 'LATHE Spindle speed given CSS and Diameter'  CSS (G96 meters/min)  5 Diameter (mm)  5 Feed rate (G98 mm/rev)  • • Optional parameter Default Cancel OK

There is an option to display the formula results for each macro individually. If the "Hide NC Assistant formula result" is ticked in General settings it will override the macro setup option

Macro Setup					? 🔀
Machine Type:	Macro definition				
Formulas	02{PI* <mark>01</mark> *0]	<b>L</b> }			~
Feed and speed Drill depth Degrees per minute Spindle speed given css and diameter					2
Inches to mm	<				>
MM to Inches	Info variable:				
Circle area	\$DATE - Date		Add Info Add I	Formula Add User	Input
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Macro B Circle	Description				
	Area				
	Prefix	Minc	Default value:	Decimals:	
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	Dinsert with sign		Remember value		
Add Rename 1					
	Allow negative	values	I Uppercase		
	Do not insert er	mpty lines	Hide formula resul	lts (in entire macro)	
CIMCO Integration					OK

## Formatting of formula values

The formatting of formula values is the same as for normal user input values

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@2{PI <b>*81*81</b>	D		2
<			>
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\$DATE · Date		Add Info Add	Formula Add User Input
Description: Area			
Prefix:	Min:	Default value:	Decimals:
Area=			As specified
	bil mus		1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Suffix	MidX.		Digits
Suffix			Digits Any
Suffix Parameter is rec	juired	Allow letters	Any N
Suffix Parameter is rec Insert with sign	guired	Allow letters	Digits Any
Suffix Parameter is rea Insert with sign Allow negative	juired values	Allow letters Remember value Uppercase	Digits Any

You can also select "as specifed" for the number of decimals for formula values. If you enter 10 (no decimal point) as the user input the formula value will be formatted with no decimal point when it is output in the NC file. If you enter 10. (with decimal point) the formula value is output with the decimal point.

Please check the results of the formulas carefully to make sure you are getting the correct value and format.

## **Outputting Fanuc macro B variables.**

The macros can output any text. If you need to output a Fanuc Macro B variable eg #1 you may need to include an extra # in front of the variable. The # symbol is used by the macros to output a line number and by putting an extra # it stops the line number being output. Please see the Macro B Circle macro in the supplied file

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achine Type:	Macro definition			
Formulas 🗸	G0 G54 G17	XO YO ZO		
Macro name	##1=0	በ ፑ25 በ		
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Feed and speed	WHILE[#1LE	1]DO1		_
Drill depth	$G_{1} = \frac{G_{1}}{G_{2}} = \frac{G_{1}}{G_{1}} = $	1 0		
Spindle speed given css and diameter	<b>##</b> 1= <b>#</b> 1+0.	1		
Degrees to Radians	END1			*
Inches to mm	*			+
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Macro B Circle	PDATE - Date			
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Degrees per minute for Linear with Ro	Prefix:	Min:	Default value:	Decimals: As specified
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Add     Rename	Prefix: Suffix: Parameter is re	Min: Max: equired	Default value:	Decimals: As specified Digits Any
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Add Rename Copy Delete	Prefix: Suffix: Parameter is re Insert with sign	Min: Max: equired n evalues empty lines	Default value:	Decimals: As specified Digits Any Its (in entire macro)