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

CIMCO Edit v5.5 - [Untitled]	
File Edit NC Functions Transmission CNC-Cal	lc <u>B</u> ackplot File C <u>o</u> mpare <u>S</u> etup <u>W</u> indow <u>H</u> elp
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NC-Assistant	
Description:	Insert: Trig Functions
	Parameters for 'Trig Functions'
	3C 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
Modify	3.401197 Ln
Cycles / Macros	30.0 Abs
Trig Functions Feed and speed	30.0 0.0
Feed and speed Drill depth	5.477226 Square root
Spindle speed given css and diameter	
Degrees to Radians	30 Floor
Inches to mm	1.0 Sign
mm to Inches	i.o ogn
Circle area	× = Optional parameter
Circle circumference	× = Optional parameter Default Cancel OK
Macro B Circle	
Degrees per minute given feedrate (Rotary only)	
Feedrate given degrees per minute (Rotary only)	
Degrees per minute for Linear with Rotary Axis motion	
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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					? 🔀
Machine Type: Formulas	Macro definition				
Trig Functions Feed and speed Dril depth Degrees per minute Spindle speed given css and diameter Degrees to Radians Inches to mm MM to Inches	Info variable:				N
Circle area Circle circumference	\$DATE - Date Description: Area		Add Info Add	Formula Add L	Jser Input
	Prefix	Minc	Default value:	Decimals:	
	Area=			3	~
	Suffix	Max		Digits	
				Any	~
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Add Rename 🏠	Insert with sign		Remember value		
	Allow negative va	lues	Uppercase		
Copy Delete 🦊	🔲 Do not insert emp	ty lines			
CIMCO Integration				C	OK

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Unitled *
NC-Assistant Area=314.159
Description: Insert: Circle area Parameters for 'Circle area' Image: Circle area Image: Circle area
Cycles / Macros
Trig Functions Feed and speed Dill 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 Editor 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> Open file multiple times Show full path in title Specify name when receiving Always show all files (*.*) Re-open files Remember cursor position Confirm program exit Hide 'Download Latest Version' Show file size in: Show size in bytes Number of linefeed characters: Mazatrol Viewer Decimals: 4 </th><th></th></t<>	 Open file multiple times Show full path in title Specify name when receiving Always show all files (*.*) Re-open files Remember cursor position Confirm program exit Hide 'Download Latest Version' Show file size in: Show size in bytes Number of linefeed characters: Mazatrol Viewer Decimals: 4 	
	Help	Default Cancel	ОК

Here is a macro with the results being shown

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	🕱 👎 🐺 🚥 💂 🋐 🕾 LATHE Spindle speed given CSS and Diameter 🕞 🔍 🤗 🛄 🖆 💂
🖹 🍋 · 🖀 🛔 🗋 🧉 · 🖆	
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) * * Optional parameter Default Cancel 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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日本 (1997年1月1日)	😤 💭 🐺 🚥 📕 🌠 🕾 LATHE Spindle speed given CSS and Diameter 🕒 🔍 🗌
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Junitled *	
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' CSS (G96 meters/min) S Diameter (mm) 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 Formulas Trig Functions	02{PI*\$1*\$1)-			~
Feed and speed Drill depth Degrees per minute Spindle speed given css and diameter Degrees to Radians					×
Inches to mm	<				2
MM to Inches	Info variable:				
Circle area Circle circumference Macro B Circle	\$DATE - Date Description:		Add Info Add I	Formula Add User	rinput
	Area				
	Prefix	Mirc	Default value:	Decimals:	
	Area=			As specified	~
	Suffix	Мак		Digits	
				Any	*
< >	Parameter is req	uired	Allow letters		
Add Rename 1	Insert with sign		Remember value		
Add Rename 👚	Allow negative v	calues.	Uppercase		
Copy Delete 🦊	Do not insert en		Hide formula result	ts (in entire macro)	
CIMCO Integration			-		OK

Formatting of formula values

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

@2{PI* <mark>\$1</mark> *\$	•		4
<			>
Info variable:			
\$DATE - Date		Add Info Add	Formula Add User Input
Description: Area			
	Min:	Default value:	Decimals:
Prefix:			
Prefix: Area= Suffix:	Max		
Area=	Max:		As specified Digits
Area=		Allow letters	As specified Digits
Area= Sulfix	quired	Allow letters	As specified Digits Any
Area= Suffix Parameter is re	quired		As specified 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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				?
lachine Type:	Macro definition			
Formulas	G0 G54 G17	XO YO ZO		
	##1=0			
Macro name	$\frac{\#}{3}$ = 0 G1 X1.0 Y1	በ ፑ25 በ		
Trig Functions				E
Feed and speed	WHILE[#1LE	.1]D01		-
Drill depth	G1 Z <mark>#</mark> 1 G2 I1.0 J	1 0		
Spindle speed given css and diameter	## 1= <mark>#</mark> 1+0.			
Degrees to Radians	END1			-
Inches to mm	4			•
mm to Inches Circle area	Info variable:			
Circle area Circle circumference	SDATE - Date		Add Info Add	Formula Add User Input
Macro B Circle	SDATE - Date		Add Info Add	
Degrees per minute given feedrate (R	Description:			0
Feedrate given degrees per minute (R	Description.			
Degrees per minute for Linear with Ro				
	Prefix:	Min:	Default value:	Decimals:
-	Prefix:	Min:	Default value:	Decimals:
-	Prefix:	Min:	Default value:	
			Default value:	As specified 💌
	Suffix:	Max:	Default value:	As specified -
(<u>III</u>)	Suffix:	Max:	Allow letters	As specified Digits Any
	Suffix:	equired	Allow letters	As specified
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