

Ai Modules

# Formula

<b>section</b>	Math
<b>short description</b>	Outputs a value calculated from the input value(s), with an easy-to-use formula language.
<b>licence level</b>	Anjuna
<b>ports</b>	Input A [numeric/control] Input B [numeric/control] Input C [numeric/control] Input D [numeric/control] Out [numeric/control] Compile Formula [pushbutton]
<b>skins</b>	Small, <b>Medium</b>

## used in example

- [Artnet Video Switch](#)
- [Midi Layer Select](#)
- [Visualiser: Moving Matrix](#)
- [Visualiser: Moving RGB Matrix](#)
- [Moving Screens](#)
- [Modules](#)

## Manual

Applies a user defined formula to the inputs and outputs the value on the Out port. The formula syntax follows the mu parser format as specified here: <http://muparser.beltoforion.de/> with a few additional functions such as the Modulus function mod(a, b) and the addition of vector component access in the Vector Formula module.



## Skins

### Medium

4 inputs, medium-sized formula textfield. Can be resized.

### Small

2 inputs, slightly smaller formula textfield. Can be resized.

## Formula language

Currently a list of the available commands is available here:

<http://beltoforion.de/article.php?a=muparser&hl=en&p=features&da=1>.

For ease of use it is replicated here, however, as always you are reffered to the original source.

### Built-in functions

The following table gives an overview of the functions supported by the default implementation. It lists the function names, the number of arguments and a brief description.

Name	Argc.	Explanation
sin	1	sine function
cos	1	cosine function
tan	1	tangens function
asin	1	arcus sine function
acos	1	arcus cosine function
atan	1	arcus tangens function
sinh	1	hyperbolic sine function
cosh	1	hyperbolic cosine
tanh	1	hyperbolic tangens function
asinh	1	hyperbolic arcus sine function
acosh	1	hyperbolic arcus tangens function
atanh	1	hyperbolic arcur tangens function
log2	1	logarithm to the base 2
log10	1	logarithm to the base 10
log	1	logarithm to base e (2.71828...)
ln	1	logarithm to base e (2.71828...)
exp	1	e raised to the power of x
sqrt	1	square root of a value
sign	1	sign function -1 if $x < 0$ ; 1 if $x > 0$
rint	1	round to nearest integer
abs	1	absolute value
min	var.	min of all arguments
max	var.	max of all arguments
sum	var.	sum of all arguments
avg	var.	mean value of all arguments

### Built-in binary operators

The following table lists the default binary operators supported by the parser.

Operator	Description	Priority
=	assignment	-1

Operator	Description	Priority
&&	logical and	1
	logical or	2
←	less or equal	4
>=	greater or equal	4
!=	not equal	4
==	equal	4
>	greater than	4
<	less than	4
+	addition	5
-	subtraction	5
*	multiplication	6
/	division	6
^	raise x to the power of y	7

\*The assignment operator is special since it changes one of its arguments and can only be applied to variables.

## Ternary Operators

muParser has built in support for the if then else operator. It uses lazy evaluation in order to make sure only the necessary branch of the expression is evaluated.

Operator	Description	Remarks
?:	if then else operator	C++ style syntax

From:

<https://avosupport.de/wiki/> - AVOSUPPORT

Permanent link:

<https://avosupport.de/wiki/ai/modules/math/formula?rev=1539526881>

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