

## LGF\_MatrixScalarMultiplication

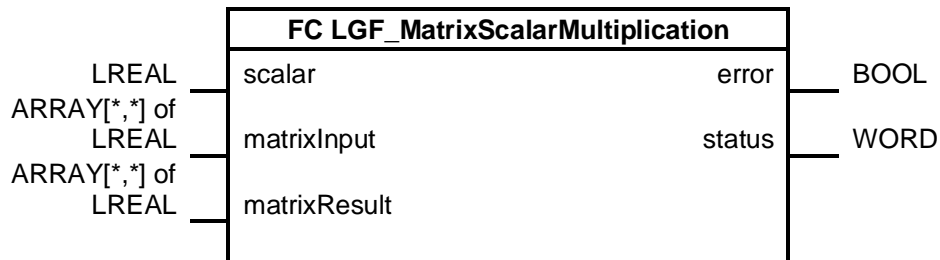
### Short description

This function block multiplies a matrix of the data type ARRAY[\*,\*] of LREAL with a scalar.

Example for 2x2 matrix:

$$b * \begin{pmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{pmatrix} = \begin{pmatrix} b * a_{11} & b * a_{12} \\ b * a_{21} & b * a_{22} \end{pmatrix}$$

### Block



### Input parameters

Parameters	Data type	Description
scalar	LREAL	Skalar

### Input/output parameters (InOut)

Parameters	Data type	Description
matrixInput	ARRAY[*,*] of LREAL	Matrix to multiply
matrix Result	ARRAY[*,*] of LREAL	Product: The resulting matrix

### Output parameters

Parameters	Data type	Description
error	BOOL	FALSE: No error TRUE: An error occurred during the execution of the FB.
status	WORD	16#0000-16#7FFF: Status of the FB, 16#8000-16#FFFF: Error identification (see following Table).

## Status and error displays

status	Meaning	Remedy / notes
16#0000	No error	-
16#8201	Lower-limit rows(Dim1) of the arrays of Matrix Input and Result Matrix are different.	All arrays must have the same low limit, for example: Array[0..2, 0..2] of LREAL
16#8202	Upper-limit rows(Dim1) of the arrays of Matrix1 and Result Matrix are different.	All arrays must have the same high limit, for example: Array[0..2, 0..2] of LREAL
16#8203	Lower-limit columns(Dim2) of the arrays of Matrix Input and Result Matrix are different.	All arrays must have the same low limit, for example: Array[0..2, 0..2] of LREAL
16#8204	Upper-limit columns(Dim2) of the arrays of Matrix Input and Result Matrix are different.	All arrays must have the same high limit, for example: Array[0..2, 0..2] of LREAL

## Principle of operation

The block multiplies a matrix of variable size by a scalar. A matrix is multiplied by a scalar, thereby multiplying each matrix element by the scalar. The result is output in the "matrixResult" matrix.

### Note

Note that the input and output matrix must have the same number of columns and rows.

## Further information on libraries in TIA Portal:

- Topic page libraries  
<https://support.industry.siemens.com/cs/ww/en/view/109738702>
- Guideline on Library Handling  
<https://support.industry.siemens.com/cs/ww/en/view/109747503>
- Programming Guideline for S7-1200/1500 in chapter "Libraries"  
<https://support.industry.siemens.com/cs/ww/en/view/81318674>
- Programming Styleguide  
<https://support.industry.siemens.com/cs/ww/en/view/81318674>