LGF_NthRoot

Short description

This block calculates the nth root of a variable.

Block

```
                    ┌─────────────────────────────────────┐
                    │          FC LGF_NthRoot             │
   LREAL ─────────── value                      Ret_Val ───────── LREAL
   LREAL ─────────── root                         error ───────── BOOL
                    │                             status ───────── WORD
                    │                                     │
                    └─────────────────────────────────────┘
```
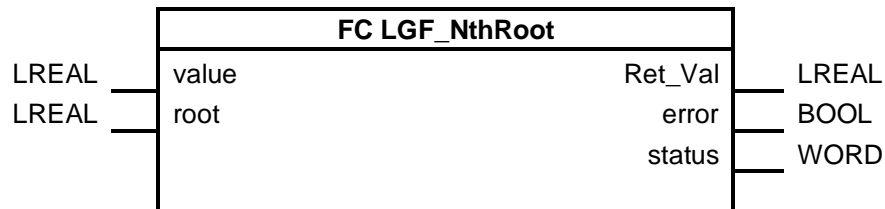
Input parameters

Parameters	Data type	Description
value	LREAL	Variable from which the root should be calculated.
root	LREAL	Root (e.g. 3 as 3rd root)

Output parameters

Parameters	Data type	Description
Ret_Val	LREAL	Output of the result
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#8200	Error: Negative value for variable "value" not allowed.	-

Principle of operation

The block calculates the nth root from a number.

The root is defined as follows:

$$Ret\_Val = \sqrt[root]{number} = number^{\frac{1}{root}}$$

STEP 7 (TIA Portal) results in the following formula:

$$Ret_{Val} = number ** (1/root)$$

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

Block from Library LGF
https://support.industry.siemens.com/cs/ww/en/view/109479728