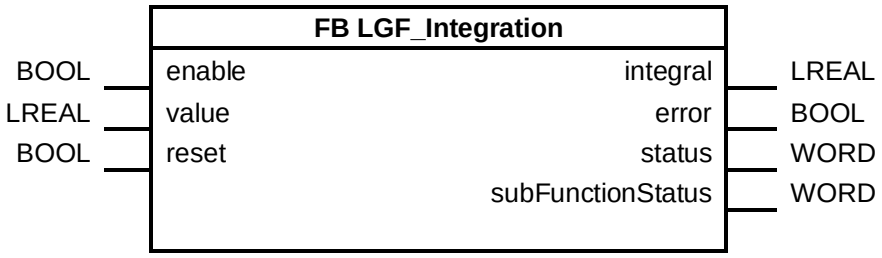
LGF_Integration

Short description

This block approximately calculates the area under a function curve. The function curve is transferred as an analog value (LREAL) which varies over time. The integral value is output on the output.

Block



Input parameters

Parameters	Data type	Description
enable	BOOL	Activation of the integral calculation. If this input is set to the value “FALSE”, the integral calculation is stopped and the “integral” output shows the last calculated value.
value	LREAL	Analog value of the continuous function curve
reset	BOOL	Sets the output “integral” to “0.0”.

Output parameters

Parameters	Data type	Description
integral	LREAL	Integrated value
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).
subFunctionStatus	WORD	Status or return value of the called FCs and system blocks.

Status and error displays

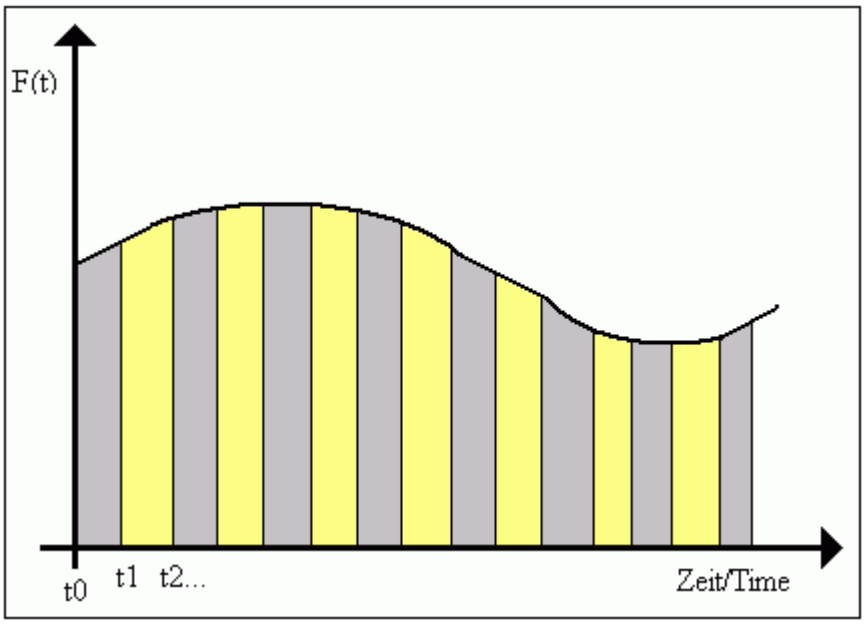
status	Meaning	Remedy / notes
16#0000	No error	-
16#8600	Error in “RD_SYS_T” command.	Check the error code in “subFunctionStatus”

Note The status of called commands is output in “subFunctionStatus”. In this case, the output value in “status” indicates which command caused the error. In this case, refer to the TIA Portal Online Help section for information on the respective commands.

Principle of operation

The integral calculation includes the summation of those trapezoidal areas that span between the last two function values on the “value” input and the time. The elapsed time is calculated via the system time of the CPU. This trapezoidal area is identical to the product of the mean value of the two process values and the time interval.

$$A = \frac{1}{2} * \left(F_{(t1)} + F_{(t0)}\right) * (t1 - t0) + \frac{1}{2} * \left(F_{(t2)} + F_{(t1)}\right) * (t2 - t1) + \cdots$$



To start the integral calculation for the input value on the “value” parameter, you must

- set the parameter “enable” to the value “TRUE”,
- set the parameter “reset” to the value “FALSE “.

If the parameter “enable” is set to the value “FALSE”, the integral calculation is stopped and the output “integral” outputs the last calculated value.

If the parameter “reset” is set to the value “TRUE”, the output “integral” is reset to “0.0”.

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