



SAFETY TECHNOLOGY

SAFEFBTEST 1.0

SAFEFBTest, the test automation tool, that allows verifying function blocks up to SIL3 according to IEC 61508.

In the past, a state diagram has proven to be very beneficial as programming basis for safety-related function blocks. The state diagram consists of different states, priorities and transitions. The transitions describe the change from one state to another by considering the priority. This process is also basis for the PLCopen function blocks.

SAFETY-RELATED VERIFICATION WITH SAFEFBTEST

Software function blocks are a decisive factor when programming safety applications for a safety control. Errors, that may occur when developing the function blocks, can be avoided or detected and controlled by suitable methods and processes according to IEC 61508. Thus, the development of function blocks according to IEC 61508 up to SIL3 requires specific methods and processes. SAFEFBTest supports the user by providing an automated test procedure.

This test procedure, that is part of the SAFEFBTest technology package, has been confirmed as suitable procedure for testing safe function blocks up to SIL3 by TÜV Rheinland (German technical inspection authority). In general, any control manufacturer or user can use SAFEFBTest. SAFEFBTest reduces the test effort and, at the same time, increases quality.

MODE OF OPERATION

The user specifies the general conditions given by the test requirements in order to verify the function block. Based on these conditions, SAFEFBTest generates all test case steps for the following automatic test procedure.

AUTOMATIC TEST CASE GENERATION

Using the state diagram defined for the function block to be tested, the general conditions for each state are specified in a default table. SAFEFBTest uses these default settings to automatically generate the test logbook. The test logbook contains the test requirements and the corresponding nominal values for each test step as well as a time dependency. The test steps automatically generated by SAFEFBTest are later used as basis for the automatic test procedure.

AUTOMATIC TEST PROCEDURE

SAFEFBTest loads the default values from the test logbook during runtime of the safety control and writes them to the inputs of the safe function block via OPC. To guarantee a PLC cycle-exact execution and verification, specific synchronization blocks are used in SAFEFBTest. As specified in the test logbook, the output data will be read from the safety plc and evaluated by SAFEFBTest. The actual values and the test results (passed / not passed) are automatically entered in the logbook.

FEATURES

SAFEFBTest enables significant quality improvement and considerably reduces the effort when verifying function blocks:

- Reduction of error sources when creating the test documents
- Reduction of error sources during the test procedure
- Simple reproducibility
- Availability of automatic test equipment (24 h per day)
- Shorter product development time
- Quality improvement

SAFEFBTEST SYSTEM SPECIFICATION

PC System ⁽¹⁾	Processor	Min. 500 MHz (recommended: 1 GHz)
	RAM	Min. 128 MB (recommended: 256 MB)
	Operating systems	Windows® XP, Windows® 7
	Mouse	Required
Software	Microsoft	Excel 2000 – 2007

⁽¹⁾ An OPC Server is required for communication between SAFEFBTest (OPC client) and control

SCOPE OF DELIVERY

- Software on CD ROM
- License agreement for SAFEFBTest
- SAFEFBTest Integration Guide

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