PLCopen – Technical Committee 5

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Safety Software

Technical Specification

Part 1: Concepts and Function Blocks

Version 1.01 – Official Release
Compliance Statement Only

Date: February 27, 2013.
This version 1.01 is an update of V 1.0 by renaming SF_SafetyGuardMonitoring to SF_GuardMonitoring cf. specification.

Appendix 1.   <u>Compliance Procedure and Compliance List</u>

Listed in this Appendix are the requirements for the compliance statement from the supplier of the safety specification. The compliance statement consists of two main groups:

1. Reduction in programming languages and functionality (see "Appendix 1.2 Reduction in the Development Environment").
2. The definition of a set of function blocks with safety-related functionality (see "Appendix 1.3 Overview of the Function Blocks").

The supplier must fill out the tables for their implementation, according to their product, committing their support to the specification itself.

By submitting these tables to PLCopen, and following approval by PLCopen, the list will be published on the PLCopen website (http://www.plcopen.org) as specified in "Appendix 2 The PLCopen Safety Logo and Its Use" below.

In addition to this approval, the supplier is provided with access and usage rights for the PLCopen Safety logo, as described in Appendix 2 The PLCopen Safety Logo and Its Use.

Appendix 1.1.   Supplier Statement

Supplier name	Baumüller Nürnberg GmbH
Supplier address	Ostendstrasse 80-90
City	90482 Nürnberg
Country	Deutschland
Phone	+49-911-5432-0
Fax	+49-911-5432-130
Website	http://www.baumueller.de
Product name	Sicherheitssteuerung b maXX safe PLC
Product version	BMC-M-SAF-02 - 11 - 02 – 00x – 00x
Release date	10/2016
Certified by	TÜV Rheinland

I hereby state that the following tables as filled out and submitted correspond to our product and the accompanying user manual, as stated above.

Name of representative: Stefan Buchner
Fertigungsleiter der Baumüller Nürnberg GmbH

Heinrich März
Leiter Entwicklung Elektronik

Date of signature (dd/mm/yyyy):

Signature:

24.04.2017   21.04.2017

(ppa. Stefan Buchner)   (i.V. Heinrich März)

Appendix 1.2. Applicable reductions in the Development Environment

Supported User Levels (See Section 4)	Supported	Comments (< 48 Characters)
Basic level	X	
Extended level	X	
System level	X	Limited to Baumüller

Table 1: Supported user levels

Supported Programming Languages	Supported	Comments (< 48 Characters)
Function Block Diagram, FBD	X	
Ladder Diagram, LD	X	
Others: - Structured Text, ST	X	(In POU Function Block only)

Table 2: Supported programming languages

Supported Data Types	Supported	Comments (< 48 Characters)
BOOL	X	
BYTE	X	
INT	X	
DINT	-	
WORD	X	
DWORD	X	
SAFEBOOL	X	
SAFEBYTE	X	
SAFEINT	X	
SAFEWORD	X	
SAFEDWORD	X	
SAFETIME	X	
REAL	-	
TIME	X	

Table 3: Supported data types

Supported Functions and FBs – Basic Level	Supported	Comments (< 48 Words)
AND	X	
OR	X	
Type Conversion functions	X	SAFEWORD_TO_SAFEBOOLS SAFEBOOLS_TO_SAFEWORD SAFEBOOL_TO_BOOL SAFEBYTE_TO_BYTE SAFEDWORD_TO_DWORD SAFEINT_TO_INT SAFETIME_TO_TIME SAFEWORD_TO_WORD
TON	X	
TOF	X	
TP	X	
CTU	X	
CTD	X	
CTUD	X	
AND	X	

Table 4: Supported Functions and Function Blocks at Basic Level

Supported Functions and FBs – Extended Level	Supported	Comments (< 48 Words)
AND	X	
OR	X	
XOR	X	
NOT	X	
ADD	X	
MUL	-	
SUB	X	
DIV	-	
GT, GE, EQ, LE, LT, NE	X	GE, GT, EQ, LE, LT, NE
Selection functions	-	
Type conversion functions	X	SAFEWORD_TO_SAFEBOOLS SAFEBOOLS_TO_SAFEWORD SAFEBITS_TO_SAFEBYTE SAFEBITS_TO_SAFEWORD SAFEBYTE_TO_SAFEBITS SAFEBYTES_TO_SAFEWORD SAFEDWORD_TO_SAFEWORDS SAFEINT_CONVERT_ENDIANESS SAFEWORD_TO_SAFEBITS SAFEWORD_TO_SAFEBYTES SAFEWORDS_TO_SAFEDWORD
Time functions	-	
TON	X	
TOF	X	
TP	X	
CTU	X	
CTD	X	
CTUD	X	
Bistable FBs	X	SR, RS
Edge detection	X	F_TRIG, R_TRIG
Others: - Clock puls generation - Shift functions	 X X	 PULS_GEN_S, PULS_GEN SHL_WORD, SHR_WORD

Table 5: Supported Functions and Function Blocks at Extended Level

Appendix 1.3. Overview of the supported Function Blocks

Function Blocks	Supported	Comments (<= 48 Characters)
SF_Equivalent	X	
SF_Antivalent	X	
SF_ModeSelector	X	
SF_EmergencyStop	X	
SF_ESPE	X	
SF_SafeStop1		
SF_SafeStop2		
SF_SafetyGuardMonitoring	X	Name: SF_GuardMonitoring
SF_SafelyLimitedSpeed		
SF_TwoHandControlTypeII	X	
SF_TwoHandControlTypeIII	X	
SF_GuardLocking	X	
SF_TestableSafetySensor	X	
SF_MutingSeq	X	

SF_MutingPar	X	
SF_MutingPar_2Sensors	X	
SF_EnableSwitch	X	
SF_SafetyRequest	X	
SF_OutControl	X	
SF_EDM	X	

Table 6: Overview of the function blocks

Appendix 2.   The PLCopen Safety Logo and Its Use

For quick identification of compliant products, PLCopen has developed a logo for the Safety Specification:

Figure 1: The PLCopen Safety logo

This logo is owned and trademarked by PLCopen.

In order to use this logo free of charge, the relevant company must meet all of the following requirements:
1. The company must be a voting member of PLCopen;
2. The company must comply with the existing specification, as specified by the PLCopen Technical Committee 5 - Safety, and as published by PLCopen, and of which this statement is a part;
3. This compliance is submitted in writing by the company to PLCopen, clearly stating the applicable software package and the supporting elements of all the specified tables, as specified in this document;
4. The company is aware that this compliance is only a statement of the supporting elements as specified in this document. In particular, the company is aware that this statement does not have any relationship to the implementation itself, nor the fulfillment of any requirements as specified in any safety standard, safety procedure, or development procedure, and does not state anything with regard to the quality of the product itself, nor certification procedures performed by a third party;
5. In the event of non-fulfillment, which must be decided by PLCopen, the company will receive a written statement to this effect from PLCopen. The company will have a period of one month to either adapt their software package in such a way that it is compliant, i.e., by issuing a new compliance statement, or removal of all reference to the specification, including the use of the logo, from all their specifications, be they technical or promotional material;
6. The logo must be used as is - i.e., in its entirety. It may only be altered in size as long as the original scale and color settings are maintained;
7. The logo must be used in the context of PLCopen Safety.