



PLCopen - Technical Committee 5

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Safety Software

Technical Specification

Part 1: Concepts and Function Blocks

Version 2.01 – Official Release
Compliance Statement Only

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Date: February 25, 2020

Appendix 1. Compliance Procedure and Compliance List

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:

- Reduction in programming languages and functionality (see "Appendix 1.2 Applicable reductions in the Development Environment ")
- The definition of a set of function blocks with safety-related functionality (see "Appendix 1.3 Overview of the supported 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	OMRON Corporation
Supplier address	2-1, 2 CHOME, NISHIKUSATSU
City	KUSATSU-CITY
Country	JAPAN
Phone	+81-77-565-5225
Fax	+81-77-565-5567
Website	https://www.omron.co.jp/
Product name	Sysmac Studio
Product version	1.x
Release date	14 January 2020
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:
Masato Aono

Date of signature (dd/mm/yyyy):
27/03/2020

Signature:



Appendix 1.2. Applicable reductions in the Development Environment

Supported User Levels (See Section 4)	Supported as v1.0 / v2.01?	Comments (< 48 Characters)
Basic level	-	
Extended level	v1.0	
System level	-	How is it supported?

Table 1: Supported user levels

Supported Programming Languages	Supported as v1.0 / v2.01?	Comments (< 48 Characters)
Function Block Diagram, FBD	v1.0	
Ladder Diagram, LD	-	
Structured Text, ST *	-	

*version 2.01 only

Table 2: Supported programming languages

Supported Data Types	Supported as v1.0 / v2.01?	Comments (< 48 Characters)
SAFEBOOL	v1.0	
ANY SAFEREAL *	-	Which?
ANY SAFEINT *	-	Which?
ANY SAFEDURATION *	-	Which?
ANY SAFEBIT *	-	
ANY SAFEDATE *	-	
BOOL	v1.0	
INT	v1.0	
DINT	v1.0	
REAL	-	
WORD	v1.0	
TIME	v1.0	
DURATION *	-	
DATE *	-	
Other ANY BIT *	-	Specify which
Other ANY INT *	-	Specify which
Other ANY REAL *	-	Specify which
ANY DATE *	-	Specify which
STRING *	-	Specify which
Structures data type *	-	See 4.3 Reduction in Data Types and Declarations

*version 1.0 only / *version 2.01 only

Table 3: Supported data types

Supported Functions and FBs	Basic Level Supported as v1.0 / v2.01?	Ext. Level Supported as v1.0 / v2.01?	Comments (< 48 Words)
AND	-	v1.0	
OR	-	v1.0	
XOR, NOT	-	v1.0	
ADD, MUL, SUB, DIV, MOD, EXPT +, *, -, /, MOD, **	-	v1.0	ADD, MUL, SUB, DIV
NEG, - *	-	-	
EQ, NE, =, <>	-	v1.0	
GT, GE, LE, LT >, >=, <=, <	-	v1.0	
SEL, MAX, MIN, LIMIT, MUX *	-	-	
Type Conversion functions	-	v1.0	BOOL_TO_DINT, BOOL_TO_INT, BOOL_TO_TIME, BOOL_TO_WORD, BYTE_TO_DINT, BYTE_TO_INT, BYTE_TO_TIME, BYTE_TO_WORD, DINT_TO_BOOL, DINT_TO_BYTE, DINT_TO_DWORD, DINT_TO_INT, DINT_TO_TIME, DINT_TO_WORD, DWORD_TO_DINT, DWORD_TO_TIME, INT_TO_BOOL, INT_TO_BYTE, INT_TO_DINT, INT_TO_DWORD, INT_TO_TIME, INT_TO_WORD, TIME_TO_BOOL, TIME_TO_BYTE, TIME_TO_DINT, TIME_TO_DWORD, TIME_TO_INT, TIME_TO_WORD, WORD_TO_BOOL, WORD_TO_BYTE, WORD_TO_DINT, WORD_TO_DWORD, WORD_TO_INT, WORD_TO_TIME
Time functions	-	v1.0	ADD, MUL, SUB, DIV
Unary REAL functions *	-	-	Specify which
TON	-	v1.0	
TOF	-	v1.0	
TP	-	v1.0	
CTU	-	v1.0	
CTD	-	v1.0	
CTUD	-	v1.0	
Bistable FB (SR, RS)	-	v1.0	SF SR, SF RS
Edge detection	-	v1.0	SF F TRIG, SF R TRIG
Others?	-	-	Specify which
Selection functions *	-	v1.0	SEL, MUX

* v1.0 only / *version 2.01 only

Table 4: Supported Functions and Function Blocks at Basic Level

Description	Ext. Level Supported as v2.01	Comments
(expression)	-	
Identifier (argument list)	-	
A := B; CV := CV+1; C:= ABS(X);	-	
Function Block Instance (...)	-	
RETURN;	-	
IF ... THEN ... ELSIF ... THEN ... ELSE ... END IF	-	
CASE ... OF ... ELSE ... END CASE	-	
FOR ... TO ... BY ... DO ... END FOR	-	
EXIT	-	
CONTINUE	-	
Others?	-	

Table 5: Supported functionality of ST at Extended Level

Appendix 1.3. Overview of the supported Function Blocks

Function Blocks	Supported as v1.0 / v2.01?	Comments (<= 48 Characters)
SF ResetButton *	-	
SF Equivalent	v1.0	
SF Antivalent	v1.0	
SF ModeSelector	v1.0	
SF EmergencyStop	v1.0	
SF ESPE	v1.0	
SF PSE *	-	
SF TwoHandControlTypeII	v1.0	
SF TwoHandControlTypeIII	v1.0	
SF TestableSafetySensor	v1.0	
SF MutingSeq	v1.0	
SF MutingPar	v1.0	
SF MutingPar_2Sensors	v1.0	
SF EnableSwitch	v1.0	
SF EnableSwitch 2 *	-	
SF Guard *	-	
SF GuardLocking 2 *	-	
SF GuardLockingSerial *	-	
SF Override *	-	
SF SafetyRequest	v1.0	
SF OutControl	v1.0	
SF EDM	v1.0	
SF SafeStop1 *	-	

SF SafeStop2 *	-	
SF SafetyGuard Monitoring *	v1.0	SF GuardMonitoring
SF SafelyLimitedSpeed *	-	
SF GuardLocking *	v1.0	

*version 1.0 only / *version 2.01 only

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.

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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.