Annex 1 of the Report

to the

Certificate

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Safety-Related Programmable System

SIMATIC S7 F/FH Systems

Manufacturer:

Siemens AG
PD PA AE R&D
Östliche Rheinbrückenstr. 50
D-76187 Karlsruhe

Report No.: SN87148C-A1
Revision 1.5 dated 2017-05-17

Testing Body:

TÜV SÜD Rail GmbH
Rail Automation
Barthstrasse 16
D-80339 München

Certification Body:

TÜV SÜD Product Service GmbH
Ridlerstrasse 65
D-80339 München

Revision Log

Version	Name	Date	Changes/History
1.0	J. Blum	2015-12-18	Initial for IEC 61508(ed.2)
1.1	G. Effenberger	2016-04-21	Added table 1.2.6 (SA85222T, SA85747T)
1.2	P. Weiß	2016-06-23	Updated certificate number (SK88771T)
1.3	P. Weiß	2016-08-10	System Version 6.2 added (SK89813T)
1.4	G. Effenberger	2017-02-01	• Application standards EN 54-2: disclosure of affected modules, indicated with X) / Report of modifications (SK 90484T) • Release Number 05 added (SN90106T): F-PM-E 24VDC/8A PPM ST (6ES7 136-6PA00-0BC0) • FW Update 5.0.1 (SN90400T) 4 F-DO DC24V/2A (6ES7 138-4FB04-0AB0)
1.5	P. Weiß	2017-05-17	New CPU410 E PN/DP added (SK91010T)

Table 1: Revision Log

Content

Safety-Certified and Interference-Free Components

1 Hardware and Firmware Components

The following system components are certified ‘safety-related’. This allows the components to be used to process safety critical signals and functions:

1.1 CPUs which are suitable for safety-related applications by using a fail-safe-application program

1.1.1 CPU S7-400H *

Name	Order Number	Release Number / Firmware Version
CPU410-5H PN/DP	6ES7 410-5HX08-0AB0	1 or higher / V8.0.0 or higher
CPU410 E PN/DP	6ES7 410-5HM08-0AB0	1 or higher / V8.2.0 or higher
CPU412-5H PN/DP	6ES7 412-5HK06-0AB0	1 or higher / V6.0.0 or higher
CPU414-5H PN/DP	6ES7 414-5HM06-0AB0	1 or higher / V6.0.0 or higher
CPU416-5H PN/DP	6ES7 416-5HS06-0AB0	1 or higher / V6.0.0 or higher
CPU417-5H PN/DP	6ES7 417-5HT06-0AB0	1 or higher / V6.0.0 or higher

Table 2: CPU S7- 400H

* The sinusoidal vibrations service conditions does not comply with the increased requirements of IEC 61131-2 2nd and 3rd Ed. The requirements of IEC 61131-2:1992 are fulfilled.

1.2 F-Modules

The following modules – marked with « X) » - do not comply with the complete test basis defined on the certificate. They are not tested in accordance to EN 54-2.

1.2.1 ET 200M

Module	Order Number	Release Number / Firmware Version	Module Description
DI 24 x DC24V	6ES7 326-1BK02-0AB0	01	24 channel digital input module 24VDC
DI 8 x NAMUR	6ES7 326-1RF01-0AB0	01	8 channel NAMUR digital input module for intrinsically-safe sensors
DO 10 x DC 24V/2A PP	6ES7 326-2BF10-0AB0	03 / V1.0.2	10 channel digital output module 24VDC/2A, P-switch
DO 8 x DC24V/2A PM	6ES7 326-2BF41-0AB0	01	8 channel digital output module 24VDC/2A, P/M-switch
AI 6 x 0/4…20 mA HART	6ES7 336-4GE00-0AB0	04 / V1.0.3	6 channel analog input module, HART
Safety Protector	6ES7 195-7KF00-0XA0	04	Safety protector protects the fail-safe signal modules from possible overvoltage

Table 3: ET 200M

1.2.2 ET 200iSP

Module	Order Number	Release Number / Firmware Version	Module Description
4F-DO Ex 17,4V/40mA	6ES7 138-7FD00-0AB0	02 / V1.0.1	4 channel digital output module 17,4VDC/40mA PP-switch
8F-DI Ex NAMUR	6ES7 138-7FN00-0AB0	02 / V1.0.1	8 channel NAMUR digital input module
4F-AI Ex HART	6ES7 138-7FA00-0AB0	02 / V1.0.1	4 channel analog input module, HART

Table 4: ET 200iSP

1.2.3 ET 200S [X)]

Module	Order Number	Release Number / Firmware Version	Module Description
4/8 F-DI DC24V	6ES7 138-4FA05-0AB0	01 / V6.0.3	4/8 channel digital input module 24VDC
4 F-DO DC24V/2A	6ES7 138-4FB04-0AB0	01 / V5.0.0, V5.0.1	4 channel digital output module 24VDC/2A; P/M switch
4F-DI/3F-DO	6ES7 138-4FC01-0AB0	02	4 channel digital input / 3 channel digital output module 24VDC/2A
1F-RO DC24V/5A, AC24...230V/5A	6ES7 138-4FR00-0AA0	03	1 channel digital relay output module DC24V/5A, AC24…230V/5A
PM-E F pm DC24V	6ES7 138-4CF03-0AB0	02	Power module 24VDC; P/M switch
PM-E F pp DC24V	6ES7 138-4CF42-0AB0	02	Power module 24VDC; P/P switch
PM-D F DC24V	3RK1903-3BA02	01	Power module 24VDC for failsafe motor starters

Table 5: ET 200S

1.2.4 ET 200pro [X)]

Module	Order Number	Release Number / Firmware Version	Module Description
8/16 F-DI DC24V	6ES7 148-4FA00-0AB0	06	8/16 channel digital input module 24VDC
4/8 F-DI/4 F-DO DC24V/2A	6ES7 148-4FC00-0AB0	06	4/8 channel digital input 24VDC and 4 channel digital output module 24VDC/2A P- / M-switch (combined)
F-Switch	6ES7 148-4FS00-0AB0	03	2 channel digital input 24VDC and 3 channel digital P- / P-switch module 24VDC (combined)

Table 6: ET 200pro

1.2.5 ET 200eco [X)]

Module	Order Number	Release Number / Firmware Version	Module Description
4/8 F-DI DC24V	6ES7 148-3FA00-0XB0	05	4/8 channel digital input module 24VDC

Table 7: ET 200eco

1.2.6 ET 200SP [X)]

Module	Order Number	Release Number / Firmware Version	Module Description
F-DI 8x24VDC HF	6ES7 136-6BA00-0CA0	01 to 04 / V1.0.5	8 channel digital input module 24VDC
F-DQ 4x24VDC/2A PM HF	6ES7 136-6DB00-0CA0	01 to 04 / V1.0.2, V1.0.3	4 channel digital output module 24VDC
F-PM-E 24VDC/8A PPM ST	6ES7 136-6PA00-0BC0	01 to 05 / V1.0.5	power module 24VDC; P- / M-switch
F-RQ 1x24VDC/24..230VAC/5A	6ES7 136-6RA00-0BF0	01 to 02	1 channel digital relay output module 24VDC/5A, 24…230VAC/5A

Table 8: ET 200SP

1.2.7 Interference-Free Components

All other components of the S7-400 and S7-300 family are 'interference-free' and allowed to be used; however, they are not certified for process safety critical signals and functions. Using these components does not interfere with the proper functioning of the safety-related modules. For details on architectural, configuration and implementation requirements please refer to the Siemens manuals of the SIMATIC S7 F/FH Systems documentation package.

2 Safety-Relevant Software Components

2.1 Option Package S7 F Systems

S7 F Systems V6.2 consists of the following certified installation units

S7 F Systems (Engineering Tool)	V6.2	
S7 F Systems Lib	V1.3 + SP2	S7 F Systems Lib (V1_3)
S7 F Systems HMI	V6.2	
S7 F ConfigurationPack	V5.5 + SP12	

S7 F Systems V6.1 + SP2 consists of the following certified installation units

S7 F Systems (Engineering Tool)	V6.1 + SP2	
S7 F Systems Lib	V1.3 + SP1 + Update1	S7 F Systems Lib (V1_3)
S7 F Systems HMI	V6.1 + SP2	
S7 F ConfigurationPack	V5.5 + SP11	

S7 F Systems V6.1 + SP2 is also certified in combination with

S7 F ConfigurationPack	V5.5 + SP12	

Table 9: Option Package S7 F- Systems

2.1.1 S7 F Systems Lib (V1_3)

F-FB	Function	Signature	Initial Value Signature
DB_INIT	F-Control block	N/A	N/A
DB_RES	F-Control block	N/A	N/A
F_1oo2AI	F-User block	013D	0CE3
F_1oo2_R	F-User block	DA53	AA5A
F_2OUT3	F-User block	34DE	D79F
F_2oo3AI	F-User block	4580 09FD ■	CE7E 874E ■
F_2oo3DI	F-User block	5323	04A0
F_2oo3_R	F-User block	AB9F	112C
F_ABS_R	F-User block	7E9D	4885
F_ADD_R	F-User block	DFBF	B1DF
F_AND4	F-User block	89B0	6837
F_AVEX_R	F-User block	E57D	947D
F_BO_FBO	F-User block	27AB	87DA
F_CHG_BO	F-User block	D042	E5F2
F_CHG_R	F-User block	E4CD	5DB5

F-FB	Function	Signature	Initial Value Signature
F_CHG_WS	F-Control block	N/A	N/A
F_CH_AI	F-User block	A293 68AF ■	3A31 1CFE ■
F_CH_BI	F-User block	E0A2	5FA7
F_CH_BO	F-User block	A8C7	A5E4
F_CH_DI	F-User block	3119	EA57
F_CH_DII	F-User block	6709	F35B
F_CH_DIO	F-User block	0AB9	CF40
F_CH_DO	F-User block	C5F2	BCEE
F_CH_II	F-User block	4D5E	4DAE
F_CH_IO	F-User block	39E2	D4D9
F_CH_RI ►	F-User block	63DF	B173
F_CMP_R	F-User block	689A	602E
F_CTUD	F-User block	609B	188C
F_CYC_CO	F-Control block	701D	424E
F_DEADTM	F-User block	1448	2566
F_DIAG	F-Control block	40FC	DDF4
F_DIV_R	F-User block	43F6	C0B8
F_FBO_BO	F-User block	N/A	N/A
F_FDI_FR	F-User block	6CFE	0D64
F_FI_FR	F-User block	672A	9FDE
F_FI_I	F-User block	N/A	N/A
F_FR_FDI	F-User block	D913	0D64
F_FR_FI	F-User block	2B3C	B269
F_FR_R	F-User block	N/A	N/A
F_FTI_TI	F-User block	N/A	N/A
F_F_TRIG	F-User block	75E7	8F11
F_INT_P	F-User block	09D7	DCDF
F_I_FI	F-User block	4871	87DA
F_LIM_HL	F-User block	A43A	1E14
F_LIM_I	F-User block	4845	4D9B
F_LIM_LL	F-User block	1451	1E14

F-FB	Function	Signature	Initial Value Signature
F_LIM_R	F-User block	B3D0	3957
F_LIM_TI	F-User block	6E64	68DC
F_MAX3_R	F-User block	C14F	F93F
F_MID3_R	F-User block	EC2C	EA98
F_MIN3_R	F-User block	D0D7	E12A
F_MOV_R	F-User block	652F	C02B
F_MOVRWS	F-Control block	N/A	N/A
F_MUL_R	F-User block	AA0F	B1DF
F_MUX16R	F-User block	AF74	EEFE
F_MUX2_R	F-User block	BFE3	9CB1
F_NOT	F-User block	9CD8	DD06
F_OR4	F-User block	5DCA	6B42
F_PA_AI	F-User block	D5C3	B5A7
F_PA_DI	F-User block	2FC7	E4F2
F_PLK	F-Control block	CD05 00AE ■	A65D A65D ■
F_PLK_O	F-Control block	45F2	7B78
F_POLYG	F-User block	FBF5	C81D
F_PS_12	F-Control block	A56A	B87A
F_PS_MIX	F-Control block	AD87	N/A
F_PSG_M	F-User block	N/A	N/A
F_PT1_P	F-User block	CAAE	300B
F_QUITES	F-User block	363D	B027
F_RCVBO	F-User block	DD4B 9FA7 ■	8360 AE75 ■
F_RCVR	F-User block	3209 875D ■	B103 C1B1 ■
F_RDS_BO	F-User block	4389 612D ■	EDD9 8C98 ■
F_REPCYC	F-User block	8F66	61F4
F_ROT	F-User block	7ECA	73FD
F_RS_FF	F-User block	6257	B56D
F_R_BO	F-User block	CC9E	E882

F-FB	Function	Signature	Initial Value Signature
F_R_FR	F-User block	4278	6BCE
F_R_R	F-User block	AC9C	237E
F_R_TRIG	F-User block	BFC8	8F11
F_SDS_BO	F-User block	C804 BE2F ■	662A 662A ■
F_SENDBO	F-User block	8D63 5889 ■	5812 5812 ■
F_SENDR	F-User block	2FE2 E3F8 ■	678B 678B ■
F_SHUTDN	F-Control block	N/A	N/A
F_SMP_AV	F-User block	5659	EEDA
F_SQRT	F-User block	3B59	6B0F
F_SR_FF	F-User block	9EBE	B56D
F_START	F-User block	5791	2151
F_SUB_R	F-User block	E217	B1DF
F_SWC_BO	F-User block	FEE7 EBCD ■	87B0 87B0 ■
F_SWC_CB ►	F-User block	8B27	6777
F_SWC_CR ►	F-User block	B396	154D
F_SWC_P	F-User block	7ADD	5A86
F_SWC_R	F-User block	1939	E2B9
F_S_BO	F-User block	59D5	1110
F_S_R	F-User block	7394	1FC2
F_TEST	F-Control block	EC5F	EB03
F_TESTC	F-Control block	680A 66AB ■	38BA F86C ■
F_TESTM	F-Control block	8B5A	9A74
F_TI_FTI	F-User block	A06D	6BCE
F_TOF	F-User block	E45B	22F6
F_TON	F-User block	38DA	22F6
F_TP	F-User block	E671	22F6
F_VFSTP1	F-Control block	N/A	N/A
F_VFSTP2	F-Control block	N/A	N/A

F-FB	Function	Signature	Initial Value Signature
F_XOR2	F-User block	6D4D	069A
F_XOUTY	F-User block selection	68A0 3B02 ■	68BE 4EB8 ■
FORCEOFF	F-Control block	N/A	N/A
RTGLOGIC	F-Control block	N/A	N/A
SWC_CHG ►	F-User block	N/A	N/A
SWC_MOS	F-User block	N/A	N/A
SWC_QOS ►	F-User block	N/A	N/A

Table 10: S7 F Systems Lib (V1_3)

■ signature of F-FB in S7 F Library V1.3 + SP2
► F-FB added in S7 F Library V1.3 + SP2

3 Non-Safety Relevant Software Components

Function	Version
S7 F Device Integration Pack	V6.2 or higher
CFC *	V7.0 SP1 or higher
STEP 7 *	V5.4 SP3 or higher

Table 11: Non-Safety Relevant Software Components

Munich, 2017-05-17

TÜV SÜD Rail GmbH
Rail Automation


Digital unterschrieben
von Peter Weiß
Datum: 2017.05.18
08:45:34 +02'00'

P. Weiß

Technical Certifier

* Further restrictions specific to modules or versions of the optional package S7 F Systems can be found in the corresponding user documentation.