Test specification of the technical function „Discharge"

SIMATIC PCS 7

Test log • August 2012

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Table of contents

1 Introduction

- This test specification does not include equipment module (EM)-specific test points, but it provides generally valid instructions for how the realized software (in CFC/SFC/PCS 7 OS) is to be tested against the EM type properties described in the specifications. This test specification can thus be used for all EM types.

- The test cases may have references to the dedicated chapter in the Functional Specification

- Each EM type is performed by means of an interconnected instance of the EM type, i.e. all external links to the control modules (CM) must exist.

- Before testing, it should be defined which signals are to be simulated in which way. To contain testing efforts and to focus the testing person's concentration on the actual test, it is advisable that at least all check back messages from the CMs be generated automatically.

- It is required for testing to have the EM available in the CFC, the SFC and the OS.

- When using the EM with SIMATIC BATCH, it is also required that the EM be available in SIMATIC BATCH for the test.

Onlinetest with following test environment

- SIMATIC S7-400 with CPU 417-4 (simulated)
- PCS 7 ES with the latest PCS 7 version

Execution

- Execution of test cases according to test specification (Input / output behaviour; operate and control functions).
- Deviations must be written into the action field.
- The SFCs test will be executed in the mode „T and B" (step mode).

2 Test Specification

2.1 Preparations

Table 2-1

Test case	Description of test case	Test result			Comment
		Fulfilled	Not fulfilled	See chapter „Activities"	
1.0	Usage of the valid Functional Specification of the EM type. Please note the version of the SFC type				Version: 1.0
1.1	Please note the FB number				FB No: 1028
1.2	Choose an instance of the EM and note the name and the path (CFC and function block).				Name of instance: B103_Discharge\ EM
1.3	Check whether all CMs in the CFC are correctly interconnected on the EM instance. Reference: CM-Configuration				
1.4	Please check if all parameter and timers are configured according to the Functional Specification. Please note all values of the parameters and timers. Reference: Parameter, Timer				Values of parameters see print-out Values of : timers see print-out
1.5	Please check, if all configured limits of the setpoints are reasonable (high, low) and note these test parameters.				Test values see print-out
1.6	Please check, if all messages, message texts and message classes are according to the Functional Specification Reference: Standard SFC-Type Messages, Individual Messages				

2.2 Test Specification of Control Strategies

Control Strategy 1 (control mode manual)

Table 2-2

Test case	Description of test case	Test result			Comment
		Fulfilled	Not fulfilled	See chapter „Activities"	
2.0	Please note the control strategy				Control Strategy: „Discharge"
2.1	Please open the faceplate of the EM and check, if after choosing the control strategy for preparation the assigned setpoint parameters are available. Reference: Setpoints				
2.2	Prepare the control strategy by setting the setpoints for the phase. Note down the parameterized values. (Test point may possibly be performed for different operating points) Please start the control strategy (via the faceplate) and check, if all steps and transitions are executing according to the Functional specification (steady-state operation). Please check in particular the status displays, the states, the steps and the position texts according to the Functional Specification. Reference: Control Strategy 1				
2.3	COMPLETE: In case of a not self-terminating EM, please execute the operation "COMPLETE" manually (via faceplate). The status „Completed" will be established. Reference: Control Strategy 1				
2.4	HOLD: Please start the control strategy (via the faceplate). Execute the manual operation „HOLD" while the EM is in the status „Run". "Held" state is generated. Visible check of "Held" mode in the screen. Reference: Control Strategy 1				
2.5	RESUME: Please execute the manual operation „RESUME" while the EM is in the status „Held". Reference: Control Strategy 1				

Test case	Description of test case	Test result			Comment
2.6	ABORT: Please start the control strategy (via the faceplate). Execute the manual operation „ABORT" while the EM is in the status „Run". "Aborted" state is generated. Reference: Control Strategy 1				
2.7	STOP: Please start the control strategy (via the faceplate). Execute the manual operation „STOP" while the EM is in the status „Run". "Stopped" state is generated. Reference: Control Strategy 1				
2.8	ERROR: Please start the control strategy (via the faceplate). Simulate an error by setting the lock input of the interlock function block in the CFC to 1. „Held (Error)" state is generated. Reference: Control Strategy 1				
2.9	RESET ERROR: Reset Error and resume the EM Please check, if the return to the run sequence is according the Functional specification. Reference: Control Strategy 1				
Optional					
2.10	If a active change of a control strategy is foreseen, please check all possibilities according the functional specification: Please start the control strategy (via the faceplate). Execute active change of control strategy according to the functional specification. Reference: Control Strategy 1				

Control Strategy 2 (control mode manual)

Table 2-3

Test case	Description of test case	Test result			Comment
		Fulfilled	Not fulfilled	See chapter „Activities"	
3.0	Please note the control strategy				Control Strategy: Drain
3.1	Please open the faceplate of the EM and check, if after choosing the control strategy for preparation the assigned setpoint parameters are available. Reference: Setpoints				
3.2	Please prepare the setpoint parameters of the control strategy and note the setpoint parameters (Test point may possibly be performed for different operating points) Please start the control strategy (via the faceplate) and check, if all steps and transitions are executing according to the Functional specification (steady-state operation). Please check in particular the status displays, the states, the steps and the position texts according to the Functional Specification. Reference: Control Strategy 2				
3.3	COMPLETE: In case of a non-self-terminating control strategy, perform the "COMPLETE" operation. The status „Completed" will be established. Reference: Control Strategy 2				
3.4	HOLD: Please start the control strategy (via the faceplate). Execute the manual operation „HOLD" while the EM is in the status „Run". "Held" state is generated. Visible check of "Held" mode in the screen. Reference: Control Strategy 2				
3.5	RESUME: Please execute the manual operation „RESUME" while the EM is in the status „Held". Reference: Control Strategy 2				

Test case	Description of test case	Test result			Comment
3.6	ABORT: Please start the control strategy (via the faceplate). Execute the manual operation „ABORT" while the EM is in the status „Run". "Aborted" state is generated. Reference: Control Strategy 2				
3.7	STOP: Please start the control strategy (via the faceplate). Execute the manual operation „STOP" while the EM is in the status „Run". "Stopped" state is generated. Reference: Control Strategy 2				
3.8	ERROR: Please start the control strategy (via the faceplate). Simulate an error by setting the lock input of the interlock function block in the CFC to 1. "Held (Error)" state is generated. Reference: Control Strategy 2				
3.9	RESET ERROR: Reset Error and resume the EM Please check, if the return to the run sequence is according the Functional specification. Reference: Control Strategy 2				
Optional					
3.10	If a active change of a control strategy is foreseen, please check all possibilities according the functional specification: Please start the control strategy (via the faceplate). In "Starting/Run" mode, perform a change of control strategy. Reference: Control Strategy 2				

Control Strategy 3 (control mode manual)

Table 2-4

Test case	Description of Test case	Test result			Comment
		Fulfilled	Not fulfilled	See chapter „Activities"	
4.0	Please note the control strategy				Control Strategy: Circulation
4.1	Please open the faceplate of the EM and check, if after choosing the control strategy for preparation the assigned setpoint parameters are available. Reference: Setpoints				
4.2	Please prepare the setpoint parameters of the control strategy and note the setpoint parameters (this test case may have different operating points) Please start the control strategy (via the faceplate) and check, if all steps and transitions are executing according to the Functional specification (steady-state operation). Please check in particular the status displays, the states, the steps and the position texts according to the Functional Specification. Reference: Control Strategy 3				
4.3	COMPLETE: In case of a non-self-terminating control strategy, perform the "COMPLETE" operation. The status „Completed" will be established. Reference: Control Strategy 3				
4.4	HOLD: Please start the control strategy (via the faceplate). Execute the manual operation „HOLD" while the EM is in the status „Run". "Held" state is generated. Visible check of "Held" mode in the screen. Reference: Control Strategy 3				
4.5	RESUME: Please execute the manual operation „RESUME" while the EM is in the status „Held". Reference: Control Strategy 3				

Test case	Description of Test case	Test result			Comment
4.6	ABORT: Please start the control strategy (via the faceplate). Execute the manual operation „ABORT" while the EM is in the status „Run". "Aborted" state is generated. Reference: Control Strategy 3				
4.7	STOP: Please start the control strategy (via the faceplate). Execute the manual operation „STOP" while the EM is in the status „Run". „Stopped" state is generated. Reference: Control Strategy 3				
4.8	ERROR: Please start the control strategy (via the faceplate). Simulate an error by setting the lock input of the interlock function block in the CFC to 1. „Held (Error)" state is generated. Reference: Control Strategy 3				
4.9	RESET ERROR: Reset error and resume the EM Please check, if the return to the run sequence is according the Functional specification. Reference: Control Strategy 3				
Optional					
4.10	If a active change of a control strategy is foreseen, please check all possibilities according the functional specification: Please start the control strategy (via the faceplate). In "Starting/Run" mode, perform a change of control strategy. Reference: Control Strategy 3				

Control Strategy 1, 2 and 3 (Auto / Batch mode)

When using the EM in automatic mode and/or with SIMATIC BATCH, this should be included in the test specification and considered.

3 Activities

Table 3-1

Ref. No.	Activity	Description
1.		
2.		
3.		
4.		

Test specification of the technical function „Discharge"
V2.0, Item-ID: 33412955

4   History

Table 4-1

Version	Date	Modifications
V1.0	04/2009	First version
V2.0	08/2012	Update Design& PCS 7 V8.0