System Test Plan

(Systemtestplan)

(TINF19C, SWE I Praxisprojekt 2020/2021)

Project: Modelling Wizard

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Version	Date	Author	Comment
0.1	22.10.2020	Jakob Schmidt	Created
0.2	08.04.2021	Jakob Schmidt	First draft
0.3	20.04.2021	Jakob Schmidt	Second draft
1.0	22.04.2021	Jakob Schmidt	Added more tests and test data
1.1	27.04.2021	Jakob Schmidt	Added delete tests
1.2	05.05.2021	Jakob Schmidt	Final Version

Content

1 Scope

The STP (System Test Plan) describes the test strategy and test planning.
It contains the tests required to check whether the requirements specified in the SRS (System Requirements Specification) [1] have been implemented in a functional manner.
The document derived from the STP is the STR (System Test Report) [2], which additionally specifies the test results.

2 Definitions

AML AutomationML
TS Testsuite
TC Testcase
GUI Graphical User Interface

3 Test Objects

The following test objects must be verified.

Ref.-ID.	Product Number	Product Name	Product Description
1	Version 2.0	Modelling Wizard	Plugin for AutomationML to create devices

4 Features

The following requirements must be verified if they are not classified as “not to be tested”.
This table shows the test coverage between functionality and test suites or test cases.

Reg.-ID.	Functionality	Priority	Testsuite ID
LF10	Basic tests. Validation of input and output.	A	TS-001
LF20	Checks if generic data are added correctly.	A	TS-002
LF30	Checks if interfaces are added correctly.	A	TS-003
LF40	Checks if attachments are added correctly	A	TS-004

5 Test Preparation Strategy

Since the Modelling Wizard does not have any Modules, the testing will be split into four parts. One for the basic functionality testing

1. Basic functionality

And three for the different types of data the Modelling Wizard can store.

2. generic data
3. interfaces
4. attachments

6 Test Execution Strategy

Because this is a further development of an already existing software, only the functionalities that have been changed or implemented by the programmers will be tested. This includes the functional requirements specified in the SRS [1] and the functionalities that were affected during bug fixing.
Since large parts of the program have been changed or optimized mainly because of the extensive bug fixes, it is worthwhile to start with testing the basic functionality to verify the correct functionality program.
After that the generic data, interfaces and attachments will be tested, to verify the different features.

7 Test Equipment

The following equipment must be available for testing:

- A computer with Windows 7 or higher
- Installed AutomationML Editor (Downloadlink)
- Installed Modelling Wizard software

The “Test Data” folder from the git repository [3]

8 Test Schedule and Budget

Hours scheduled

	Phillip Tran (LE)	**Jakob Schmidt (TM)**
Test	20h	70h

Planned budget

	Budget
Test	3.700€

9 Test Planning

Testsuite	**Test Objective**	**Testplan Creator**	**Testplan Reviewer**	**Tester**
TS-001	Basic functionality	Jakob Schmidt	Phillip Tran	Jakob Schmidt
TS-002	Generic data	Jakob Schmidt	Phillip Tran	Jakob Schmidt
TS-003	Interfaces	Jakob Schmidt	Phillip Tran	Jakob Schmidt
TS-004	Attachments	Jakob Schmidt	Phillip Tran	Jakob Schmidt

10 Reference/ Standards

[1] „SRS,“ [Online]. Available: https://github.com/DekaAthlos/TINF19C-ModellingWizard/wiki/1.-Software-Requirements--Specification.

[2] „STR,“ [Online]. Available: https://github.com/DekaAthlos/TINF19C-ModellingWizard/wiki/5.-Systemtestreport.

[3] „Test Data,“ [Online]. Available: https://github.com/DekaAthlos/TINF19C-ModellingWizard/tree/master/PROJECT/Test%20Data.

11 Testcases

11.1 Test suite <TS-001 Basic functionality>

11.1.1 Testcase <TC-001-001> (Create device)

Testcase ID	**TC-001-001**
Testcase Name	Create device
Req.-ID.	LF10
Description	This testcase verifies that a device can be created and saved.

Test Steps		
Step	Action	Expected Result
1	Select the “File” dropdown and click on “new”.	A new empty Modelling Wizard window opens.
2	Fill “Vendors Name” and “Device Name” in the top navbar, with data from TD-001-001.	Data is entered and automatically filled into the attributes below
	Fill the red marked entries in the “Attributes” table at the bottom of the screen with data from TD-001-001.	Data is entered.
	Click on a free spot on the GUI	The current selected field in the table gets deselected (and the value is saved)
	Select the “File” dropdown and click on “save”.	A dropdown of the explorer opens, and the name of the file can be chosen.
	Enter a name and click “save”.	A popup opens and informs about the correct creation and the path of the file. If the name already the explorer will ask for confirmation of the saving.
	Confirm the message.	The popup closes.
	Open the file in AutomationML and verify that all data is saved.	The file gets opened and under Attributes all data can be found.

Test data	**TD-001-001**					
Dataset	**Vendor Name**	**Device Name**	**ManufacturerURI**	**Device Class**	**Product Code**	**Validation**

1	DHBW	Server	www.aml.com	Computer	00256	Valid
2	DHBW	Server	aml	Computer	00256	Fail
3	DHBW	Server	www.aml.com		00256	Fail
4	-	-	www.aml.com	Computer	00256	Fail
5	-	-	-	-	-	Fail

11.1.2 Testcase <TC-001-002> (Open device, save changes)

Testcase ID	**TC-001-002**
Testcase Name	Open device, save changes
Req.-ID.	LF10
Description	This testcase verifies that a device can be loaded with its data, that the data can be changed and that it can be saved again.

Test Steps

Step	Action	Expected Result
1	Select the “File” dropdown and click on “open”.	The explorer opens, and the file can be chosen.
	Choose the test file from TD-001-002 and click “open”	“Vendor Name” and “Device Name” gets filled. The Name o the file will be displayed in the top right corner. All generic data, interfaces and attachments will be accessible over their tabs. (If the Modelling Wizard can not read the file an error message will be shown, and no file will be opened.)
	Fill the red marked entries with data from TD-001-002.	Data is overwritten.
	Click on a free spot on the GUI	The current selected field in the table gets deselected (and the value is saved)
	Select the “File” dropdown and click on “save”.	A dropdown of the explorer opens, and the name of the file can be chosen.
	Enter a name and click “save”.	A popup opens and informs about the correct creation and the path of the file. If the name already the explorer will ask for confirmation of the saving.
	Confirm the message.	The popup closes.
	Open the file in AutomationML and verify that all data is saved.	The file gets opened and unde Attributes all data can be found.

Test data	TD-001-002				
Data set	**File**	**Manufacturer URI**	**Device Class**	**Product Code**	**Validation**
1	DHBW_Testfile_01.amlx	www.dhbw.com	Computer	000665000	Valid
2	DHBW_Testfile_02.amlx	DHBW.png	-	(no change)	Fail
3	Corrupt_Testfile_01_Wrong_Structure.amlx	(no change)	(no change)	(no change)	Valid (pop up – cannot read file)
4	Foreign_Testfile_01_Balluff-BNI_PNT-508-105-Z015-CAEX3-20201022.amlx	(no change)	(no change)	(no change)	Valid

11.1.3 Testcase <TC-001-003> (Load standard libraries)

Testcase ID	**TC-001-003**
Testcase Name	Load standard libraries
Req.-ID.	LF10
Description	This testcase verifies that the standard libraries can be loaded into the Modelling Wizard.

Test Steps

Step	Action	Expected Result
1	Select the “Standard Libraries” dropdown in the top navbar.	A dropdown of the libraries opens, and one can be chosen.
	Choose one library that is not already loaded.	The library will be loaded and can be found on the right sight under “Role Class Library” or “Interface Class Library”

11.2 Test suite <TS-002 Generic data>

11.2.1 Testcase <TC-002-001> (Create device with attributes)

Testcase ID	**TC-002-001**
Testcase Name	Create device with attributes
Req.-ID.	LF20
Description	This testcase verifies that a device with data in the attributes and the header of “Generic Data” can be created and saved.

Test Steps

Step	Action	Expected Result
1	Select the “File” dropdown and click on “new”.	A new empty Modelling Wizard window opens.
2	Fill “Vendors Name” and “Device Name” in the top navbar, with data from TD-002-001.	Data is entered.
	Fill the entries with data from TD-002-001	Data is entered.
	Click on “Header” besides “Attributes”	The “Header” table opens

	Fill the entries with data from TD-002-001	Data is entered
	Click on a free spot on the GUI	The current selected field in the table gets deselected (and the value is saved)
	Select the “File” dropdown and click on “save”.	A dropdown of the explorer opens, and the name of the file can be chosen.
	Enter a name and click “save”.	A popup opens and informs about the correct creation and the path of the file. If the name already the explorer will ask for confirmation of the saving.
	Confirm the message.	The popup closes.
	Open the file in AutomationML and verify that all data is saved.	The file gets opened and under Attributes all data can be found.

Test data				TD-002-001									
Dataset		**Vendor Name**	**Device Name**	**ManufacturerURI**	**Device Class**	**Product Code**	**Temperature Min**	**Temperature Max**	**City**	**Website**	**(Header) Copyright**	**(Header) ID**	**Validation**
1	Values	DHBW	Server	www.aml.com	Computer	00256	15	45	Berlin	ML.com	MIT license	ID-001	Valid
	Default	-	-	-	-	-	20	40					
	Units	-	-	-	-	-	Degree	Degree	Names	Urls			
2	Values	DHBW	Server	www.aml.com	Computer	00256	15	45	Berlin	ML.com	MIT license	ID-002	Valid
	Default	-	-	-	-	-	20	40	default	default			
	Units	-	-	-	-	-	Degree	Degree	Names	Urls			

11.2.2 Testcase <TC-002-002> (Create device with role classes)

Testcase ID	TC-002-002
Testcase Name	Create device with role classes
Req.-ID.	LF20
Description	This testcase verifies that a device with loaded classes from “Role Class Library” can be created and saved.

Test Steps

Step	Action	Expected Result
1	Select the “File” dropdown and click on “new”.	A new empty Modelling Wizard window opens.
2	Fill “Vendors Name” and “Device Name” in the top navbar, with data from TD-002-002.	Data is entered.
	Fill the red marked entries in the “Attributes” table at the bottom of the screen with data from TD-002-002.	Data is entered.
	Click on the library “Library Name” (Data from TD-002-001) on the right side under “Role Class Library”	The entry gets highlighted.
	Drag and drop the library onto the “Generic Information” table.	The library gets added at the last position.
	Click on the library in the “Generic Information” table.	The entry gets highlighted. A label with the entry name appears underneath the table.
	Click on the new label.	The label gets highlighted.
	Double click on the label.	Underneath the label the “Attributes” table opens. If the class consists of sub classes, these are displayed as indented labels.
	Fill the entries with data from TD-002-002	Data is entered.
	Click on the label of the subclass.	The label gets highlighted.
	Double click on the subclass.	Underneath the label the “Attributes” table for the specific subclass opens.
	Fill the entries with data from TD-002-002	Data is entered

	Click on a free spot on the GUI	The current selected field in the table gets deselected (and the value is saved)
	Select the “File” dropdown and click on “save”.	A dropdown of the explorer opens, and the name of the file can be chosen.
	Enter a name and click “save”.	A popup opens and informs about the correct creation and the path of the file. If the name already the explorer will ask for confirmation of the saving.
	Confirm the message.	The popup closes.
	Open the file in AutomationML and verify that all data is saved.	The file gets opened and under Attributes all data can be found.

Test data	TD-002-002

Data set		**Vendor Name**	**Device Name**	**Manufacturer URI**	**Device Class**	**Product Code**	**Library Name**	**Spec Version**	**DocLang**	**refURI**	**MIMEType**	**Version**	**Validation**
1	Values	DHBW	Server	www.aml.com	Computer	00256	“AutomationML ComponentBaseRCL” >> “AdditionalDeviceDescription {Class: External Data}”-	1.0.0	En	001	.doc	1.0.0	Valid
	Default	-						1.0.0	En	000	.docx	1.0.0	
	Units	-						Version numbers	Country Code	Digits	Word	Version numbers	

Data set		**Vendor Name**	**Device Name**	**Manufacturer URI**	**Device Class**	**Product Code**	**Library Name**	**refURI**	**MIMEType**	**Validation**
2		DHBW	Server	www.aml.com	Computer	00256	“AutomationMLComponent StandardRCL” >> “Component Icon {Class: Icon}”	001	.png	Valid
								000	.jpg	
								Digits	Picture	

11.2.3 Testcase <TC-002-003> (Open device, delete data)

Testcase ID	**TC-002-003**
Testcase Name	Open device, delete data
Req.-ID.	LF20
Description	This testcase verifies that attributes and “Role Class Libraires” can be deleted from a device.

Test Steps		
Step	Action	Expected Result
1	Select the “File” dropdown and click on “open”.	The explorer opens, and the file can be chosen.
	Choose the test file from TD-002-003 and click “open”	“Vendor Name” and “Device Name” gets filled. The Name of the file will be displayed in the top right corner. All generic data, interfaces and attachments will be accessible over their tabs.
	Clear the attributes listed in “Delete Attributes” (Data from TD-002-003)	Data is overwritten.
	Repeat the following two step one time for each entry listed in “Delete Library” (Data from TD-002-003)	
	Select the library in the “Generic Information” table, which is listed in “Delete Library” (Data from TD-002-003)	The library gets selected in the “Generic Information” table
	Press the “Delete” button in the top right corner of the table.	The library gets deleted
	Select the “File” dropdown and click on “save”.	A dropdown of the explorer opens, and the name of the file can be chosen.
	Enter a name and click “save”.	A popup opens and informs about the correct creation and the path of the file. If the name already the explorer will ask for confirmation of the saving.
	Confirm the message.	The popup closes.
	Open the file in AutomationML and verify that all data is saved.	The file gets opened and under Attributes all data can be found.

Test data	**TD-002-003**

Data set	File	Delete Attributes	Delete Library	Validation
1	DHBW_Testfile_03.amlx	OrderCode	-	Valid
		SerialNumber	-	
2	DHBW_Testfile_04.amlx	-	“AutomationML ComponentBaseRCL/ AdditionalDeviceDescription”	Valid
		-	“AutomationMLComponent StandardRCL/Component Icon	

11.3 Test suite <TS-003 Interfaces>

11.3.1 Testcase <TC-003-001> (Create device with interfaces)

Testcase ID	**TC-003-001**
Testcase Name	Create device with interfaces
Req.-ID.	LF30
Description	This testcase verifies that a device with additional interfaces can be created and saved.

Test Steps		
Step	Action	Expected Result
1	Select the “File” dropdown and click on “new”.	A new empty Modelling Wizard window opens.
2	Fill “Vendors Name” and “Device Name” in the top navbar, with data from TD-003-001.	Data is entered.
	Fill the red marked entries in the “Attributes” table at the bottom of the screen with data from TD-003-001.	Data is entered.
	Click on the “Interfaces” tab below the top navbar.	The interface view opens.
	Click on the interface “Interface Name” (Data from TD-003-001) on the right side under “Interface Class Library”	The entry gets highlighted.
	Drag and drop the interface onto the “Interfaces” table.	The interface gets added at the last position.
	Click on the interface in the “Interfaces” table.	The entry gets highlighted. A label with the entry name appears underneath the table.
	Click on the new label.	The label gets highlighted.
	Double click on the label.	Underneath the label the “Attributes” table opens.
	Fill the entries with data from TD-003-001.	Data is entered.
	Select the “File” dropdown and click on “save”.	A dropdown of the explorer opens, and the name of the file can be chosen.
	Enter a name and click “save”.	A popup opens and informs about the correct creation and the path of the file.

		If the name already the explorer will ask for confirmation of the saving.
	Confirm the message.	The popup closes.
	Open the file in AutomationML and verify that all data is saved.	The file gets opened and under Attributes all data can be found.

Test data	TD-003-001

Data set		**Vendor Name**	**Device Name**	**ManufacturerURI**	**Device Class**	**Product Code**	**Interface Name**	**Direction**	**Validation**
1	Values	DHBW	Server	www.aml.com	Computer	00256	“AutomationMLInterfaceClassLib” >> “AutomationMLBaseInterface” >> “ Order{Class: AutomationMLBaseInterface}”	Top	Valid
	Default	-						Top	
	Units	-						Directions	
2	Values	DHBW	Server	www.aml.com	Computer	00256	“AutomationMLInterfaceClassLib” >> “AutomationMLBaseInterface” >> “ Order{Class: AutomationMLBaseInterface}”		Valid
	Default	-							
	Units	-							

Dataset		**Vendor Name**	**Device Name**	**ManufacturerURI**	**Device Class**	**Product Code**	**Library Name**	**refURI**	**MIMEType**	**Validation**
3	Values	DHBW	Server	www.aml.com	Computer	00256	“AutomationMLComponentBaseICL” >> “2DReference{Class: ExternalDataReference}”	001	.png	Valid
	Default	-						000	.jpg	
	Units	-						digits	Picture	

11.3.2 Testcase <TC-003-002> (Open device, delete interfaces)

Testcase ID	**TC-003-002**
Testcase Name	Open device, delete interfaces
Req.-ID.	LF30
Description	This testcase verifies that interfaces can be deleted from a device.

Test Steps		
Step	Action	Expected Result
1	Select the “File” dropdown and click on “open”.	The explorer opens, and the file can be chosen.
	Choose the test file from TD-003-002 and click “open”	“Vendor Name” and “Device Name” gets filled. The Name of the file will be displayed in the top right corner. All generic data, interfaces and attachments will be accessible over their tabs.
	Click on the “Interfaces” tab below the top navbar.	The Interfaces view opens.
	Repeat the following two step one time for each entry listed in “Delete Interface” (Data from TD-003-002)	
	Select the interface in the “Interfaces” table, which is listed in “Delete Interface” (Data from TD-003-002)	The interface gets selected in the “Interfaces” table
	Press the “Delete” button in the top right corner of the table.	The interface gets deleted
	Select the “File” dropdown and click on “save”.	A dropdown of the explorer opens, and the name of the file can be chosen.
	Enter a name and click “save”.	A popup opens and informs about the correct creation and the path of the file. If the name already the explorer will ask for confirmation of the saving.
	Confirm the message.	The popup closes.
	Open the file in AutomationML and verify that all data is saved.	The file gets opened and under Attributes all data can be found.

Test data	**TD-003-002**

Data set	File	Delete Interface	Validation
1	DHBW_Testfile_05.amlx	Order	Valid
		2DReference	

11.4Test suite <TS-004 Attachments>

11.4.1 Testcase <TC-004-001> (Create device with attachments)

Testcase ID	**TC-004-001**
Testcase Name	Create device with attachments
Req.-ID.	LF40
Description	This testcase verifies that a device with attachments can be created and saved.

Test Steps		
Step	Action	Expected Result
1	Select the “File” dropdown and click on “new”.	A new empty Modelling Wizard window opens.
2	Fill “Vendors Name” and “Device Name” in the top navbar, with data from TD-004-001.	Data is entered.
	Fill the red marked entries in the “Attributes” table at the bottom of the screen with data from TD-004-001.	Data is entered.
	Click on the “Attachments” tab below the top navbar.	The attachment view opens.
	Click on the “Add” button in the upper left corner.	A dropdown list opens.
	Choose the “Dropdown” (Data from TD-004-001).	The name gets added to the two text fields underneath.
	Click “Select File” button	An explorer opens.
	Search the test File (Data from TD-004-001) and click open	The “Element Name” and the “File Path” in the “Attachable Information” table get filled with the test data.
	Click on the “Add” button in the upper left corner.	A dropdown list opens.
	Choose the “Dropdown2” (Data from TD-004-001).	The name gets added to the two text fields underneath.
	Paste the “Test Path” (Data from TD-004-001) into the text field besides the “Add Path” button	The path is pasted.
	Click “Add Path” button	The “Element Name” and the “File Path” in the “Attachable Information” table get filled with the test data.

	Select the “File” dropdown and click on “save”.	A dropdown of the explorer opens, and the name of the file can be chosen.
	Enter a name and click “save”.	A popup opens and informs about the correct creation and the path of the file. If the name already exists the explorer will ask for confirmation of the saving.
	Confirm the message.	The popup closes.
	Open the file in AutomationML and verify that all data is saved.	The file gets opened and under Attributes all data can be found.

Test data	TD-004-001

Data set		**Vendor Name**	**Device Name**	**ManufacturerURI**	**Device Class**	**Product Code**	**Dropdown**	**Test File**	**Dropdown2**	**Test Path**	**Validation**
1	Values	DHBW	Server	www.aml.com	Computer	00256	Certificate	Manual.pdf	-	-	Valid
	Default	-									
	Units	-									
2	Values	DHBW	Server	www.aml.com	Computer	00256	Component Icon	DHBW.png	Component Picture	“https://upload.wikimedia.org/wikipedia/de/thumb/1/1d/DHBW-Logo.svg/2000px-DHBW-Logo.svg.png”	Valid
	Default	-									
	Units	-									
3	Values	DHBW	Server	www.aml.com	Computer	00256		-	ShortGuide	“https://docplayer.net/19663746-C-to-c-a-somewhat-short-guide.html”	Valid
	Default	-									
	Units	-									

11.4.2 Testcase <TC-004-002> (Open device, delete Attachments)

Testcase ID	**TC-004-002**
Testcase Name	Open device, delete interfaces
Req.-ID.	LF40
Description	This testcase verifies that interfaces can be deleted from a device.

Test Steps

Step	Action	Expected Result
1	Select the “File” dropdown and click on “open”.	The explorer opens, and the file can be chosen.
	Choose the test file from TD-004-002 and click “open”	“Vendor Name” and “Device Name” gets filled. The Name of the file will be displayed in the top right corner. All generic data, interfaces and attachments will be accessible over their tabs.
	Click on the “Attachments” tab below the top navbar.	The attachment view opens.
	Repeat the following two step one time for each entry listed in “Delete Attachments” (Data from TD-004-002)	
	Select the interface in the “Attachables Information” table, which is listed in “Delete Attachments” (Data from TD-004-002)	The interface gets selected in the “Attachables Information” table
	Press the “Delete” button in the top right corner of the table.	The attachment gets deleted
	Select the “File” dropdown and click on “save”.	A dropdown of the explorer opens, and the name of the file can be chosen.
	Enter a name and click “save”.	A popup opens and informs about the correct creation and the path of the file. If the name already the explorer will ask for confirmation of the saving.
	Confirm the message.	The popup closes.
	Open the file in AutomationML and verify that all data is saved.	The file gets opened and under Attributes all data can be found.

Test data	TD-004-002		
Data set	**File**	**Delete Attachment**	**Validation**
1	DHBW_Testfile_06.amlx	ComponentIcon	Valid
		ShortGuide	