System Test Plan

(Systemtestplan)

**(TINF19C, SWE I Praxisprojekt 2020/2021)**

Project: Modelling Wizard

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| --- | --- | --- | --- |
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| 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 |
| 0.4 | 22.04.2021 | Jakob Schmidt | Added more tests and test data |
|  |  |  |  |
|  |  |  |  |

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# 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.

# Definitions

AML AutomationML  
TS Testsuite  
TC Testcase

GUI Graphical User Interface

# 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 |

# 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. (copied)

|  |  |  |  |
| --- | --- | --- | --- |
| 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 |
| LF50 | Check if the plugin was installed correctly | B | TS-001 |

# Test Preparation Strategy

Since the Modelling Wizard does not have any Modules, the testing will be split into four parts. Three for the different types of data the Modelling Wizard can store and one for the basic functionality testing.

# Test Execution Strategy

Although this is a further development of an already existing software, the number of bugs in the previous version makes a complete testing of the software necessary.

First the Basic functionality will be tested, to verify the program.

After that the generic data, interfaces and attachments will be tested, to verify the different features.

# Test Equipment

The following equipment must be available for testing:

• A computer with Windows 7 or higher

• Installed AutomationML Editor ([Downloadlink](https://www.youtube.com/watch?v=dQw4w9WgXcQ))

• Installed Modelling Wizard software

# Test Schedule and Budget

No budget is needed for the tests, as they are all performed by hand.

# Test Planning

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

# 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/tree/master/PROJECT/STR. |

# Testcases

## Testsuite <TS-001 Basic functionality>

### 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. | | | |
|  | Click on “AutomationComponent{ Class: AutomationMLBaseRole}” in the top 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 new label. | | | | | | Underneath the label the “Attributes” table opens. “Manufacturer” and “Model” are already filled with data from “Vendors Name” and “Device Name”. | | | |
|  | Fill the red marked entries with data from TD-001-001. | | | | | | 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. | | | |
|  | | | | | | | | | | |
|  | | | | | | | | | | |
| Testdata | | | TD-001-001 | | | | | | | |
| Dataset | | **Vendor Name** | | **Device Name** | | **ManufacturerURI** | | **Device Class** | **Product Code** | **Validation** |
| 1 | | DHBW | | Server | | - | | - | - | Valid |
| 2 | | DHBW | | Server | | - | | - | - | Valid |
| 3 | | Null | | Null | | - | | - | - | Fail |
|  | | | | | | | | | | |

### 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 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 “AutomationComponent{ Class: AutomationMLBaseRole}” in the top 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 new label. | | | | | | Underneath the label the “Attributes” table opens. “Manufacturer” and “Model” are already filled with data from “Vendors Name” and “Device Name”. | | |
|  | Fill the red marked entries with data from TD-001-002. | | | | | | Data is overwritten. | | |
|  | Select the “File” dropdown and click on “save”. | | | | | | A dropdown of the explorer opens, and the name of the file can be chosen. The Name should be the same, if “Vendor Name” and “Device Name” have not changed. | | |
|  | 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. | | |
|  | | | | | | | | | |
|  | | | | | | | | | |
| Testdata | | | TD-001-002 | | | | | | |
| Dataset | | **File** | | | **ManufacturerURI** | **Device Class** | | **Product Code** | **Validation** |
| 1 | | DHBW\_Testfile\_01.amlx | | | - | - | | - | Valid |
| 1 | | DHBW\_Testfile\_02.amlx | | | DHBW\_URI | Computer | | 000419000 | Valid |
| 1 | | null | | | - | - | | - | Valid |
|  | | | | | | | | | |

### 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. | | The explorer opens, and the library file can be chosen. |
|  | Choose one library that is not already loaded and click open | | The library will be loaded and can be found on the right sight under “Role Class Library” or “Interface Class Library” |
|  | | | |

### Testcase <TC-001-004> (Load external libraries)

|  |  |  |  |
| --- | --- | --- | --- |
| Testcase ID | | TC-001-004 | |
| Testcase Name | | Load external libraries | |
| Req.-ID. | | LF10 | |
| Description | | This testcase verifies that the external libraries can be loaded into the Modelling Wizard. | |
| Test Steps | | | |
| Step | Action | | Expected Result |
| 1 | Select the “File” dropdown and click on “Load Library”. | | 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” |
|  | | | |

## Testsuite <TS-001 Generic data>

### 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. |
|  | Click on “AutomationComponent{ Class: AutomationMLBaseRole}” in the top 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 new label. | | Underneath the label the “Attributes” table opens. “Manufacturer” and “Model” are already filled with data from “Vendors Name” and “Device Name”. |
|  | 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 |
|  | 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. |
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| Testdata | | | | | 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 | uridhbw | | Computer | 000418000 | 15 | 45 | Berlin | ML.com | MIT license | ID-001 | Valid |
| Default | - | - | - | | - | - | 20 | 40 |  |  |
| Units | - | - | - | | - | - | Degree | Degree | Names | Urls |
| 2 | Values | DHBW | Server | uridhbw | | Computer | 000418000 | 15 | 45 | Berlin | ML.com | MIT license | ID-002 | Valid |
| Default | - | - | - | | - | - | 20 | 40 | default | default |
| Units | - | - | - | | - | - | Degree | Degree | Names | Urls |
|  | | | | | | | | | | | | | | |

### 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-002-001. | | 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 |
|  | 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. |
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| Testdata | | | | | TD-002-002 | | | | | | | | | | |
| Dataset |  | **Vendor Name** | | **Device Name** | | | **Library Name** | **Spec Version** | **DocLang** | | **refURI** | **MIMEType** | | **Version** | **Validation** |
| 1 | Values | DHBW | | Server | | | “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 |
| Dataset |  | **Vendor Name** | **Device Name** | | | **Library Name** | | | | **refURI** | | | **MIMEType** | | **Validation** |
| 2 | Values | DHBW | Server | | | “AutomationMLComponentStandardRCL”  >>  “Component Icon{Class: Icon}” | | | | 001 | | | .png | | Valid |
| Default | - | - | | | 000 | | | .jpg | |
| Units | - | - | | | digits | | | Picture | |
|  | | | | | | | | | | | | | | | |

## Testsuite <TS-003 Interfaces>

### 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. |
|  | Click on the “Interfaces” tab below the top navbar. | | The Interfaces 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. |
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| Testdata | | | TD-003-001 | | | | | | | | |
| Dataset |  | **Vendor Name** | | | **Device Name** | | **Interface Name** | | **Direction** | | **Validation** |
| 1 | Values | DHBW | | | Server | | “AutomationMLInterfaceClassLib”  >>  “AutomationMLBaseInterface”  >> “  Order{Class: AutomationMLBaseInterface}” | | Top | | Valid |
| Default | - | | | - | | Top | |
| Units | - | | | - | | Directions | |
| 2 | Values | DHBW | | | Server | | “AutomationMLInterfaceClassLib”  >>  “AutomationMLBaseInterface”  >> “  Order{Class: AutomationMLBaseInterface}” | | - | | Valid |
| Default | - | | | - | | - | |
| Units | - | | | - | | - | |
| Dataset |  | **Vendor Name** | | **Device Name** | | **Library Name** | | **refURI** | | **MIMEType** | **Validation** |
| 3 | Values | DHBW | | Server | | “AutomationMLComponentBaseICL”  >>  “2DReference{Class: ExternalDataReference}” | | 001 | | .png | Valid |
| Default | - | | - | | 000 | | .jpg |
| Units | - | | - | | digits | | Picture |
|  | | | | | | | | | | | |

## Testsuite <TS-004 Attachments>

### 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. | | |
|  | 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. | | |
|  | 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. | | |
|  | | | | | | | | | |
| Testdata | | | TD-001-001 | | | | | | |
| Dataset | | **Vendor Name** | | | **Device Name** | **Dropdown** | | **Test file** | **Validation** |
| 1 | | DHBW | | | Server | Certificate | | DHBW.pdf | Valid |
| 2 | | DHBW | | | Server | Component  Icon | | DHBW.png | Valid |
|  | | | | | | | | | |

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| Testdata | | | TD-003-001 | | | | | | | | |
| Dataset |  | **Vendor Name** | | | **Device Name** | | **Interface Name** | | **Direction** | | **Validation** |
| 1 | Values | DHBW | | | Server | | “AutomationMLInterfaceClassLib”  >>  “AutomationMLBaseInterface”  >> “  Order{Class: AutomationMLBaseInterface}” | | Top | | Valid |
| Default | - | | | - | | Top | |
| Units | - | | | - | | Directions | |
| 2 | Values | DHBW | | | Server | | “AutomationMLInterfaceClassLib”  >>  “AutomationMLBaseInterface”  >> “  Order{Class: AutomationMLBaseInterface}” | | - | | Valid |
| Default | - | | | - | | - | |
| Units | - | | | - | | - | |
| Dataset |  | **Vendor Name** | | **Device Name** | | **Library Name** | | **refURI** | | **MIMEType** | **Validation** |
| 3 | Values | DHBW | | Server | | “AutomationMLComponentBaseICL”  >>  “2DReference{Class: ExternalDataReference}” | | 001 | | .png | Valid |
| Default | - | | - | | 000 | | .jpg |
| Units | - | | - | | digits | | Picture |
|  | | | | | | | | | | | |