

User-interface sub-system test plan

Propulsion system simulation

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# Aim & Hypothesis

## Aim

The aim of this test is to verify the user interface of the propulsion system of the Solar boat.

## Hypothesis

The user interface will be verified according to the performed tests.

# Variables

These are the constants and variables that will be used during the test.

|  |  |
| --- | --- |
| Constants simulation | Keep constant at... |
| Ambient temperature | Standard indoor temperature with lower and upper limits (20 ℃ ± 5℃). |
| Battery level computer | Constant power source. |
| All input variables | Real positive numbers & ISO-notation. |

## Normal Input

The limits stated are the limits of the real world. If values out of this range are entered, the outputs will be unreliable.

|  |  |
| --- | --- |
| Inputs | Value |
| Boat speed [m/s] | A numeric number |
| Properties setting values | Nonzero numeric numbers |

## Unusual Input

|  |  |
| --- | --- |
| Inputs | Value |
| Boat speed [m/s] | A non-numeric symbol or a letter |
| Properties setting values | Zeros or non-numeric symbols or letters |

## Outputs

These are the outputs that will be monitored and will be used to see variations or changes in the system.

|  |  |
| --- | --- |
| Outputs | Value |
| Prompts for successful simulation | - |
| Warning for unsuccessful simulation and wrong inputs | - |

# Tools

|  |  |
| --- | --- |
| Testing tools | Demand |
| Computer | Windows 10 compatible |
| Excel | Newest version |
| Keyboard | No limit |
| Mouse | No limit |
| Calculator | Basic calculator |
| Pen & Paper | Basic pen & paper |

# Method

This section consists of actions that need to be performed during the test to conclude a result. The conditions of the constants stated in chapter “2. Variables” have to be met before executing the simulation. To execute the simulation, follow the steps stated in “4.1. Steps”.

This test will use an independent part which has no relationship with the calculation sub-system which will be used in the final design. We create a new calculation part to check if user-interface sub-system can give correct prompts or waring in different situations.

## 4.1 Steps

1. Set properties first, give all properties nonzero and numeric values.
2. Input a numeric boat speed. Record the message box result.
3. Input a non-numeric value to boat speed. Record the message box result.
4. Change one of the properties into a non-numeric value of zero. Record the message box result.
5. Input a random boat speed (no matter what type the input is). Record the message box result.

# Expected results

The expected results of the outputs are as followed.

With normal inputs, after changing the input boat speed, there should be message boxes with a prompt: Successful simulation.

With unusual inputs, after changing the input boat speed, there should be message box with WARNING in it. And there are following situations:

|  |  |  |  |
| --- | --- | --- | --- |
| Properties | Boat speed | Message box outputs (In input-output sheet) | Message box outputs (In properties setting sheet) |
| With zero values | No matter what types of value it is. | WARNING: Input error. All property inputs shouldn't be zero | WARNING: Simulation can't be processed. There should be no zero or unumerice value in properties setting |
| With non-numeric values | WARNING: Input error. All property inputs should be numeric |
| With numeric values | With non-numeric values | - | WARNING: Input error. Input should be a numeric number |
| With numeric values | Successful simulation |

# Conclusion

When we input different boat speeds and properties, there are corresponding prompts and waring message boxes which follow the list in desired results. We state the tests successful.

If the output message boxes have results which are not mentioned in the desired results list, we state the tests failed.