Assignment 4: Software Testing Document (STD) with Security by Design (SBD)

Project Name: PHOSHO	Team ID: 29	Mentor(s): Niek Aukes, Lucas Pruijssers

Table 1: Vulnerabilities and Mitigation Summary

Points (Manual and Automated Testing)	Vulnerabilities Identified (name them)	Mitigation Plan	Tick ✓ (if completed all points)	Remarks (if any)
1. Manual Security Test - Rightful authentication of the user	**Everybody can login even with wrong password**	Make unit tests to check if correct username + password is needed to login	✓	When logging in with wrong details log in is denied
2. Manual Security Test - Rightful use of privilege of a user	A normal user can access admin functionality	Make a unit tests to check if privilege is checked and handled	✓	When trying to do admin http request as a user the user is denied access
3. Manual Security Test - Input Validation Test	Improper input handling **(e.g., no validation or sanitization)**	Validate and sanitize all inputs (user, sensor, config)	✓	When trying to enter malicious code into fields that allow inputs, the input is rejected.
4. Unit Connection Test	Invalid messages reception	Ignore invalid commands from the server, make sure if the data invalid it is simply not used.	✓	Ensure we check if messages received from the network has valid format.
5. Manual Component Test - Input reception test	Input dropping on spamming, infrared receptors trigger too often	Manually test the button input and infra-red input(receiver) to react accordingly.	✓	Infrared receptors would toggle even when not transmitting. +

Table 2: Testing Log (Unit and Manual Tests):

Prepared by: Dipti K. Sarmah, D.K. (EEMCS), Version: 1.2

Test Strategy	Date	Process /Function	Test Case Step	Description	Status (Passed/Failed/Open)	Expected Results	Actual Result	Mitigation Plan/Solutions	Review on Mitigation Plan (Passed/Failed)	Remarks on the Failed Mitigation Plan
Unit Test	29.10.2025	Authentication of the user	Step 1: Go to server/tests directory in the project Step2: Run the TestAuthLogin_Success test in the Auth_test.go file	Verify that user can login successfully	Passed	User is logged in successfully	User is logged in sucessfully	Correct login validation logic implemented	Passed	-
Unit Test	29.10.2025	Admin protected endpoints	Step 2: Test user login with invalid credentials	User without admin privileges cannot access protected endpoints	Passed	Request to protected branch is denied	Request is denied	Proper response to request without enough permissions	Passed	-
Unit Test	28.10.2025	Client-connection logic.	Step 1: Test webs	Client pi responds to game state messages	Passed	Pi handles the server messages correctly.	Pi handles the messages	Identifies invalid server messages.	Passed	-
Manual Testing	27.10.2025	Login, username field	Step1: Go to login page Step2: Enter XSS test script Step3: Press login	Verifies that the sanitizer works as expected to prevent XSS attacks	Passed	Sanitizer rejects the input	Sanitizer rejects the input and displays Invalid Characters in the username	Sanitize all the inputs	Passed	-
Manual Testing	28.10.2025	Input	Step 1: Test if all input components work.	Ensure system handles inputs and responds accordingly	Passed	System accepts input and responds.	Success	Only allow legal inputs.	Passed	-

Table 3: Usage of AI Tools and Team Review:

Team Member Name	Reviewed Document (✓)	Date Reviewed	AI Tools Used (Yes/No)	If Yes, Specify How Used
Richard Šimoník	✓	29.10.2025	Yes	Used ChatGPT for debugging purposes and Claude to generate the JSON specification for teammates from the code.
Marciano Brouwer	✓	29.10.2025	Yes	Used ChatGPT to learn more about some functions in the python libraries that were used.
Peter Pilon	✓	29.10.2025	Yes	Used Gemini to learn more about python libraries and raspberry pi 5 configurations
Muhammad Ahmed	✓	29.10.2025	Yes	Used ChatGPT for learning the Go programming language and used Claude to generate the JSON specification for teammates from the code.
Berk Ayermolali	✓	29.10.2025	Yes	Used ChatGPT to help me understand the logic of connecting endpoints with the backend.
Orbay Kanioglu	✓	29.10.2025	Yes	Used ChatGPT to get some help with XSS test scripts in order to test if our input sanitizer works on the login page.