1.0   Power Supply

1.1.1.   Voltage Regulation

Requirement	Verification
1. Raspberry Pi 4 can run steadily for at least 15 minutes with all of its peripherals on with a 12V to 5V converter. 2. ESP32 can run without any problem running off of the pcb-mounted 12 V to 3.3 V converter.	1. Raspberry Pi can steadily run the locker program for at least 15 minutes. 2. A. ESP32 runs all testing without failing.

1.2.   Control Module

Requirement	Verification
1. Can retrieve the user data table from the server in under 5 minutes. 2. Can send control messages over the data bus to notify the according locker module to unlock its electric lock using RS485 signal standard. 3. Can match the user-input code with valid pick-up and drop-off codes. 4. Can receive input from the touchscreen and display instructions to users.	1. A slave device on the databus can receive a correct message in RS485 signal standard from RPI4. 2. Can recognize input from the keypad and display it on screen. 3. Can react to the touch action from the touchscreen.

1.2.1. ROM Storage

Requirement	Verification
1. Can store at least twenty 720p images.	1. Display an image stored in the ROM.

1.2.2. Camera

Requirement	Verification

1. Must be able to take 720p photos whenever a locker is opened and transfer photo data to the microcontroller to be stored on a MicroSD card.	1.
	  A. Take a picture when a person walks close. Check the MicroSD card for a photo.
	
	  B. Take a picture when a locker module is opened. Check the MicroSD card for a photo.

1.2.3. LCD Display

Requirement	Verification

1. Will react to touch input from the user.
 	
2. Able to display images with half a second refresh rate or lower.
	1. Respond to touch and display different content.
	2.
	  A. Code a program that changes the LCD screen when it is touched.
	  B. Time how long it takes for the screen to change.

1.2.4. Keypad

Requirement	Verification
1. Signals from all buttons can be transmitted without error.	1. Press the 12 keys on the pad to ensure and check whether the connector has the correct signal

	output.

1.2.5. PIR Sensor

Requirement	Verification
1. The sensor detects when someone walks within five feet of the front of the control module.	1. Walk in front of the sensor and check to see if the signal output is high.

1.3. Locker modules
1.3.1. Microcontroller

Requirement	Verification

1. Able to send unlock signals to its associated locker.
 	
2. Able to communicate with the Control Unit over the databus in RS485 signal standard.
	1.
	  A. Code the slave microcontroller to send an unlock signal to its associated lock
	  B. Verify that the lock opens
	2.
	  A. Send an unlock message over the data bus to the slave microcontroller
	  B. Verify that the associated lock opens

1.4.   Software
1.4.1.   Cloud Storage/Database

Requirement	Verification

1. Store locker images for up to two weeks
 	
2. Store user data table
	1.
	  A. Upload an image to the cloud through the API the RPI4 will be using.
	  B. Check the storage/database for the new image.
	2.
	  A. Change a user pick-up code on the locker website
	  B. Display the user data table from cloud storage/database and verify that the pick-up code has changed.

1.4.2.   Web Page Frontend

Requirement	Verification

1. Let users log in with their deposit codes.
 	
2. Let users change their deposit and pickup code once they log in.
 	
3. Let the user check whether or not there are any packages stored in the locker for them.
	1. Use the password to log in.
	2.
	  A. Change its deposit code and pickup code
	  B. Log back in and check the newest deposit code and pickup code.
	  C. Open the locker door using a deposit code
	  D. Verify that there is notification that says there is a package ready for pick-up.

1.4.3. User Interface

Requirement	Verification
1. Gives users and delivery services clear instructions for deposit and pickup of packages. 2. Secure state machine that does not have undefined behavior.	1. A person without prior experience with this locker system can finish deposit and pickof of a package following the instructions on the display. 2. Try all possible user behavior and the system should function normally.

1.4.4. Data Bus and Device Addressing

Requirement	Verification
1. Locker modules have a distinct address. 2. Locker modules can recognize a message directed to its address.	1. Ensure each locker module has a unique address. 2. Verify that the locker opens when it is addressed.