

# Hazard Analysis

## MECHTRON 4TB6

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Table 1: Revision History

Date	Developer(s)	Change
10/12/2022	Ahmed	Added FMEA analysis
Date2	Name(s)	Description of changes

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[You are free to modify this template. —SS]

## **1 Introduction**

[You can include your definition of what a hazard is here. —SS]

## **2 Scope and Purpose of Hazard Analysis**

## **3 System Boundaries and Components**

## **4 Critical Assumptions**

[These assumptions that are made about the software or system. You should minimize the number of assumptions that remove potential hazards. For instance, you could assume a part will never fail, but it is generally better to include this potential failure mode. —SS]

## 5 Failure Mode and Effect Analysis

Component	Ref	Failure Mode	Effects of Failure	Cause of Failure	Recommended Actions
Hardware	H1.1	Sensor data is not sent to PC	Test data is not captured by our device	<ul style="list-style-type: none"> <li>• Wi-Fi Module is broken</li> <li>• USB Device is not connected</li> <li>• Device is not connected to Wi-Fi network</li> </ul>	Using the LCD display show the systems connectivity
	H1.2	System does not have power	Device is off and not operational	<ul style="list-style-type: none"> <li>• Battery died</li> <li>• Power cables are disconnected</li> <li>• Too much current is drawn from Arduino</li> </ul>	<ul style="list-style-type: none"> <li>• Add a battery indicator to the screen to alert the user if the battery is low</li> <li>• Make the sensors get their power directly from the power source and not the arduino</li> </ul>
	H1.3	Hardware falls off the mount	<ul style="list-style-type: none"> <li>• Hardware device breaks/gets damaged</li> <li>• Sensors capture incorrect data</li> <li>• Potential injury to those in vehicle</li> </ul>	<ul style="list-style-type: none"> <li>• User didn't affix Hardware properly</li> <li>• Mounting mechanism failed</li> </ul>	The mounting mechanism should give the user feedback when the device is mounted correctly
	H1.4	Display turns off	Cannot view the status of the device	<ul style="list-style-type: none"> <li>• LCD display failure</li> <li>• LCD is improperly connected</li> <li>• Arduino is drawing too much current</li> </ul>	
	H1.5	Threshold alert not displaying	User will not be notified	<ul style="list-style-type: none"> <li>• Sensor failure</li> <li>• Refer to H1.4</li> <li>• Threshold not set up by user in the Desktop App</li> </ul>	
Desktop Application	H2.1	App cant see hardware device	Refer to H1.1	<ul style="list-style-type: none"> <li>• Refer to H1.1</li> <li>• COM Port is being used by another application</li> </ul>	

	H2.2	Data from the hardware device is lost	Test results will all be lost	<ul style="list-style-type: none"> <li>• Application suddenly closes during test</li> <li>• Hardware device disconnects from PC</li> </ul>	Store last test data into local storage
	H2.3	Cannot view live data	User will not be able to see data during test runs	<ul style="list-style-type: none"> <li>• Sensors are not connected</li> <li>• Refer to H1.1</li> </ul>	
	H2.4	Data cannot be sent to database	Test results will all be lost and will not be viewable in the analytics platform	<ul style="list-style-type: none"> <li>• Database failure</li> <li>• Connection failure</li> <li>• PC not connected to the internet</li> </ul>	
Database	H3.1	Too much data is sent to the database	The database is getting overloaded with data causing it to crash or freeze	User submits too much data within a very short time period	Add a cool down timer after the user submits the data to the database so they won't be able to spam it constantly
Data Analytics Website	H4.1	User cannot login	User will not have access to dashboard	<ul style="list-style-type: none"> <li>• User does not have an account</li> <li>• User's credentials don't match</li> </ul>	
	H4.2	User cannot view the dashboard	Users cannot view KPIs of tests	• User does not have required permissions	
	H4.3	Data not being displayed		<ul style="list-style-type: none"> <li>• Database failure</li> <li>• Authentication error</li> </ul>	

[Include your FMEA table here —SS]

## 6 Safety and Security Requirements

[Newly discovered requirements. These should also be added to the SRS. (A rationale design process how and why to fake it.) —SS]

## 7 Roadmap

[Which safety requirements will be implemented as part of the capstone timeline? Which requirements will be implemented in the future? —SS]