

# Software Requirements Specification MECHTRON

## 4TB6: Formulate

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# Contents

<b>1</b>	<b>Introduction</b>	<b>3</b>
1.1	Project Description . . . . .	3
1.2	Purpose . . . . .	3
1.3	Project Scope . . . . .	3
1.4	Table of Symbols . . . . .	3
1.5	Abbreviations and Acronyms . . . . .	3
<b>2</b>	<b>User Characteristics</b>	<b>4</b>
2.1	Stakeholders . . . . .	4
2.2	Use Cases . . . . .	4
2.3	User Consideration . . . . .	4
2.4	Impact . . . . .	4
<b>3</b>	<b>System Description</b>	<b>4</b>
3.1	Assumptions . . . . .	4
3.2	Context Diagram . . . . .	4
3.3	State Transition Diagram . . . . .	4
3.4	Monitored and Controlled Variables . . . . .	4
3.5	Functional Decomposition Diagram . . . . .	4
<b>4</b>	<b>Requirements</b>	<b>4</b>
4.1	Functional Requirements . . . . .	4
4.1.1	Hardware . . . . .	5
4.1.2	Desktop Application . . . . .	5
4.1.3	Data Analytics Platform . . . . .	5
4.2	Nonfunctional Requirements . . . . .	6
4.3	Likely Changes . . . . .	6
4.4	Unlikely Changes . . . . .	6
<b>5</b>	<b>Development Plan</b>	<b>6</b>

## Revision History

Date	Version	Notes
Date 1	1.0	Notes
Date 2	1.1	Notes

# 1 Introduction

## 1.1 Project Description

## 1.2 Purpose

## 1.3 Project Scope

## 1.4 Table of Symbols

Symbol	Unit	Description
$A_C$	m <sup>2</sup>	coil surface area

## 1.5 Abbreviations and Acronyms

Symbol	Description
SAE	Society of Automotive Engineers
DD	Data Definition
GD	General Definition
GS	Goal Statement
IM	Instance Model
LC	Likely Change
PS	Physical System Description
R	Requirement
SRS	Software Requirements Specification
DBTL	Design Build Test Learning
KPI	Key Performance Indicators

Monitored Variable, Description, Type, Units

## 2 User Characteristics

### 2.1 Stakeholders

### 2.2 Use Cases

### 2.3 User Consideration

### 2.4 Impact

## 3 System Description

### 3.1 Assumptions

### 3.2 Context Diagram

### 3.3 State Transition Diagram

### 3.4 Monitored and Controlled Variables

Monitored Variable	Type	Units	Description

Table 1.0: Monitored Variables

Controlled Variable	Type	Units	Description

Table 2.0: Controlled Variables

### 3.5 Functional Decomposition Diagram

## 4 Requirements

This section provides the functional requirements, the business tasks that the software is expected to complete, and the nonfunctional requirements, the qualities that the software is expected to exhibit.

### 4.1 Functional Requirements

Formulate consists of 3 main components, each with its own functional requirements. The hardware section addresses the sensors and physical device which interacts directly with the user, the desktop application is the means for the user to select modes and submit data and

the data analytics platform is for the user to view old test case data to check if KPIs are met.

#### **4.1.1 Hardware**

FR 1: The base device should contain a rechargeable battery

##### **Rationale tEST**

FR 2: The base device should have a screen to display the current status to the user

FR 3: The base device should easily mount to the Formula SAE car

FR 4: The base device should connect to a PC wirelessly and wired to transmit data

FR 5: The base device should alert the user if any tests exceed the operating condition of the car

FR 6: The base device should have 5 connection ports to add module sensors to it

FR 7: The modular sensors should have a snap on mounting mechanism to connect to the base

#### **4.1.2 Desktop Application**

FR 8: The application should show live raw data from the sensors

[Rationale:] The device should contain a rechargeable battery

FR 9: The application should allow users to preview the data after a test

FR 10: The application should allow the user to send the data to the database

FR 11: The application should allow the user to trim the data before sending it to the database

FR12:

#### **4.1.3 Data Analytics Platform**

FR 13: The website should only allow users who have access to view the data

FR 14: The website should have the option to filter out the data by test conducted

FR 15: The website should show whether the tests passed according to threshold values

FR 16: The application should allow the user to trim the data before sending it to the database

FR17:

## 4.2 Nonfunctional Requirements

NFR1: Maintainability

NFR2: Portability

## 4.3 Likely Changes

LC1:

## 4.4 Unlikely Changes

LC2: [Give the unlikely changes. The design can assume that the changes listed will not occur. —TPLT]

# 5 Development Plan

## References



[The following is not part of the template, just some things to consider when filing in the template. —TPLT]

[Grammar, flow and L<sup>A</sup>T<sub>E</sub>X advice:

- For Mac users \*.DS\_Store should be in .gitignore
- L<sup>A</sup>T<sub>E</sub>X and formatting rules
  - Variables are italic, everything else not, includes subscripts ([link to document](#))
    - \* [Conventions](#)
    - \* Watch out for implied multiplication
  - Use BibTeX
  - Use cross-referencing
- Grammar and writing rules
  - Acronyms expanded on first usage (not just in table of acronyms)
  - “In order to” should be “to”

—TPLT]

[Advice on using the template:

- Difference between physical and software constraints
- Properties of a correct solution means *additional* properties, not a restating of the requirements (may be “not applicable” for your problem). If you have a table of output constraints, then these are properties of a correct solution.
- Assumptions have to be invoked somewhere
- “Referenced by” implies that there is an explicit reference
- Think of traceability matrix, list of assumption invocations and list of reference by fields as automatically generatable
- If you say the format of the output (plot, table etc), then your requirement could be more abstract

—TPLT]