Software Requirements Specification

for

<Solar Controller>

Version 1.0 approved

Prepared by <June Patrick Dacaya & Nicholas Phillip>

<SOL Software Solutions>

<10/1/2019>

Table of Contents

[1. Introduction 1](#_Toc20810069)

[1.1 Purpose 1](#_Toc20810070)

[1.2 Product Scope 1](#_Toc20810071)

[1.3 Intended Audience and Reading Suggestions 1](#_Toc20810072)

[1.4 References 1](#_Toc20810073)

[2. Overall Description 1](#_Toc20810074)

[2.1 Product Perspective 1](#_Toc20810075)

[2.2 Product Functions 2](#_Toc20810076)

[2.3 User Classes and Characteristics 2](#_Toc20810077)

[2.4 Operating Environment 2](#_Toc20810078)

[2.5 Design and Implementation Constraints 2](#_Toc20810079)

[2.6 User Documentation 2](#_Toc20810080)

[2.7 Assumptions and Dependencies 2](#_Toc20810081)

[3. External Interface Requirements 3](#_Toc20810082)

[3.1 User Interfaces 3](#_Toc20810083)

[3.2 Hardware Interfaces 3](#_Toc20810084)

[3.3 Communications Interfaces 3](#_Toc20810085)

[4. System Features 3](#_Toc20810086)

[4.1 System Feature 1 3](#_Toc20810087)

[4.2 System Feature 2 (and so on) 4](#_Toc20810088)

[5. Other Nonfunctional Requirements 4](#_Toc20810089)

[5.1 Performance Requirements 4](#_Toc20810090)

[5.2 Safety Requirements 4](#_Toc20810091)

[5.3 Security Requirements 4](#_Toc20810092)

[5.4 Software Quality Attributes 4](#_Toc20810093)

[5.5 Business Rules 5](#_Toc20810094)

[6. Other Requirements 5](#_Toc20810095)

Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Date** | **Reason For Changes** | **Version** |
|  |  |  |  |
|  |  |  |  |

# Introduction

## Purpose

<Identify the product whose software requirements are specified in this document, including the revision or release number. Describe the scope of the product that is covered by this SRS, particularly if this SRS describes only part of the system or a single subsystem.>

The purpose of this document is to create an android application that will control a solar panel using a mobile device. The main purpose of the APP will be: reading how much power the solar panel currently harvesting, controlling the solar panels position which depends on the suns position from the solar panel, and monitoring the current state of the solar panel.

## Product Scope

<Provide a short description of the software being specified and its purpose, including hardware, relevant benefits, objectives, and goals. Relate the software to corporate goals or business strategies. If a separate vision and scope document is available, refer to it rather than duplicating its contents here.>

## Intended Audience and Reading Suggestions

<Describe the different types of reader that the document is intended for, such as developers, project managers, marketing staff, users, testers, and documentation writers. Describe what the rest of this SRS contains and how it is organized. Suggest a sequence for reading the document, beginning with the overview sections and proceeding through the sections that are most pertinent to each reader type.>

This project is a prototype that is intended for our professors, collaborators, and fellow developers. This has been created using the guidance of our college professor. This project will be useful for everyone who would like to create a solar panel system and will have the ability of controlling the position and monitoring its state.

## References

<List any other documents or Web addresses to which this SRS refers. These may include user interface style guides, contracts, standards, system requirements specifications, use case documents, or a vision and scope document. Provide enough information so that the reader could access a copy of each reference, including title, author, version number, date, and source or location.>

Software Requirements Specification document with example

By Ravi Bandakkanavar | August 2, 2017

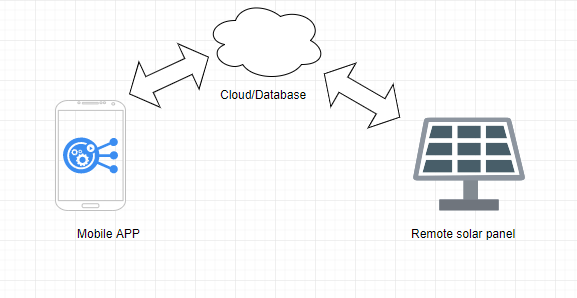
<https://krazytech.com/projects/sample-software-requirements-specificationsrs-report-airline-database>

# Overall Description

## Product Perspective

<Describe the context and origin of the product being specified in this SRS. For example, state whether this product is a follow-on member of a product family, a replacement for certain existing systems, or a new, self-contained product. If the SRS defines a component of a larger system, relate the requirements of the larger system to the functionality of this software and identify interfaces between the two. A simple diagram that shows the major components of the overall system, subsystem interconnections, and external interfaces can be helpful.>

APP users will have a remote access to their solar panels and the capabilities of controlling the solar panels positioning.



## Product Functions

<Summarize the major functions the product must perform or must let the user perform. Details will be provided in Section 3, so only a high level summary (such as a bullet list) is needed here. Organize the functions to make them understandable to any reader of the SRS. A picture of the major groups of related requirements and how they relate, such as a top level data flow diagram or object class diagram, is often effective.>

A solar controller will have the ability of monitoring

* solar panels readings
* assisting weather
* controlling the panels for optimizing solar harvesting

All this via a remote mobile app.

## User Classes and Characteristics

<Identify the various user classes that you anticipate will use this product. User classes may be differentiated based on frequency of use, subset of product functions used, technical expertise, security or privilege levels, educational level, or experience. Describe the pertinent characteristics of each user class. Certain requirements may pertain only to certain user classes. Distinguish the most important user classes for this product from those who are less important to satisfy.>

Users can have their solar panels in their hands as they can monitor and control the panel using the mobile app. They should be able to check the status of the panels. If the panel is not in the best position on reference with the sun, users will have the ability to control the panels with the GUI within the app. The app will be able to adjust 2 values such as rotation and the panels tilt. Users will have access to all the data collected from the solar panel through the database and display of the mobile app. User’s can login to keep their personal data such as power harvested within the month/yearly separated only for them.

## Operating Environment

<Describe the environment in which the software will operate, including the hardware platform, operating system and versions, and any other software components or applications with which it must peacefully coexist.>

The mobile app will run and access data from database. Using the database information, the users can monitor their panels activity as well as control it. The control will be from the mobile app which will be sent into the database then through the cloud the command will be pass into the panel for it to move. A PLC will be implemented in the panel to control 2 kind of motors that will rotate the panel and tilt it.

## Design and Implementation Constraints

<Describe any items or issues that will limit the options available to the developers. These might include: corporate or regulatory policies; hardware limitations (timing requirements, memory requirements); interfaces to other applications; specific technologies, tools, and databases to be used; parallel operations; language requirements; communications protocols; security considerations; design conventions or programming standards (for example, if the customer’s organization will be responsible for maintaining the delivered software).>

The mobile app will consist of multiple screens: Home screen, Settings, Control, Readings, and more. We will be developing this using Android Studio with Firebase as database for the system. The app will have 2 languages: English and French. Maintenance will be conducted every month that will fix various bugs found in the system. Both the panel and APP will be connected in the same database and will use similar data accordingly.

.

## User Documentation

<List the user documentation components (such as user manuals, on-line help, and tutorials) that will be delivered along with the software. Identify any known user documentation delivery formats or standards.>

* Online help
* Tutorials
* Customer Service

All this documentation will help the user on using and understanding on how to use the app in union with their solar panel.

## Assumptions and Dependencies

<List any assumed factors (as opposed to known facts) that could affect the requirements stated in the SRS. These could include third-party or commercial components that you plan to use, issues around the development or operating environment, or constraints. The project could be affected if these assumptions are incorrect, are not shared, or change. Also identify any dependencies the project has on external factors, such as software components that you intend to reuse from another project, unless they are already documented elsewhere (for example, in the vision and scope document or the project plan).>

# External Interface Requirements

## User Interfaces

<Describe the logical characteristics of each interface between the software product and the users. This may include sample screen images, any GUI standards or product family style guides that are to be followed, screen layout constraints, standard buttons and functions (e.g., help) that will appear on every screen, keyboard shortcuts, error message display standards, and so on. Define the software components for which a user interface is needed. Details of the user interface design should be documented in a separate user interface specification.>

Home screen will have the systems important links like control screen, and readings screen to monitor the panel. Setting screen will have the options like change the language preference. Control screen will have the capability to change the value/position of the panel.

Data will be always up to date and collected whenever the panel is in used. Cloud database will keep the panels up to date readings and displayed on the mobile app.

## Hardware Interfaces

<Describe the logical and physical characteristics of each interface between the software product and the hardware components of the system. This may include the supported device types, the nature of the data and control interactions between the software and the hardware, and communication protocols to be used.>

The mobile App will be used to control the panel as well as display its readings. Motors will be control using the app while readings from the panels will be displayed in the mobile app. This communication will use internet protocols and access to the database to perform actions.

## Communications Interfaces

<Describe the requirements associated with any communications functions required by this product, including e-mail, web browser, network server communications protocols, electronic forms, and so on. Define any pertinent message formatting. Identify any communication standards that will be used, such as FTP or HTTP. Specify any communication security or encryption issues, data transfer rates, and synchronization mechanisms.>

# System Features

<This template illustrates organizing the functional requirements for the product by system features, the major services provided by the product. You may prefer to organize this section by use case, mode of operation, user class, object class, functional hierarchy, or combinations of these, whatever makes the most logical sense for your product.>

## Remote Panel Control

<Don’t really say “System Feature 1.” State the feature name in just a few words.>

4.1.1 Description and Priority

<Provide a short description of the feature and indicate whether it is of High, Medium, or Low priority. You could also include specific priority component ratings, such as benefit, penalty, cost, and risk (each rated on a relative scale from a low of 1 to a high of 9).>

|  |  |
| --- | --- |
| Component | Rating |
| Benefit |  |
| Penalty |  |
| Cost |  |
| Risk |  |

4.1.2 Stimulus/Response Sequences

<List the sequences of user actions and system responses that stimulate the behavior defined for this feature. These will correspond to the dialog elements associated with use cases.>

4.1.3 Functional Requirements

<Itemize the detailed functional requirements associated with this feature. These are the software capabilities that must be present in order for the user to carry out the services provided by the feature, or to execute the use case. Include how the product should respond to anticipated error conditions or invalid inputs. Requirements should be concise, complete, unambiguous, verifiable, and necessary. Use “TBD” as a placeholder to indicate when necessary information is not yet available.>

<Each requirement should be uniquely identified with a sequence number or a meaningful tag of some kind.>

REQ-1: Android APP

REQ-2: Database Connection

REQ-3: Panel is connected to the database

## System Feature 2 (and so on)

# Other Nonfunctional Requirements

## Performance Requirements

<If there are performance requirements for the product under various circumstances, state them here and explain their rationale, to help the developers understand the intent and make suitable design choices. Specify the timing relationships for real time systems. Make such requirements as specific as possible. You may need to state performance requirements for individual functional requirements or features.>

## Safety Requirements

<Specify those requirements that are concerned with possible loss, damage, or harm that could result from the use of the product. Define any safeguards or actions that must be taken, as well as actions that must be prevented. Refer to any external policies or regulations that state safety issues that affect the product’s design or use. Define any safety certifications that must be satisfied.>

## Security Requirements

<Specify any requirements regarding security or privacy issues surrounding use of the product or protection of the data used or created by the product. Define any user identity authentication requirements. Refer to any external policies or regulations containing security issues that affect the product. Define any security or privacy certifications that must be satisfied.>

## Software Quality Attributes

<Specify any additional quality characteristics for the product that will be important to either the customers or the developers. Some to consider are: adaptability, availability, correctness, flexibility, interoperability, maintainability, portability, reliability, reusability, robustness, testability, and usability. Write these to be specific, quantitative, and verifiable when possible. At the least, clarify the relative preferences for various attributes, such as ease of use over ease of learning.>

## Business Rules

<List any operating principles about the product, such as which individuals or roles can perform which functions under specific circumstances. These are not functional requirements in themselves, but they may imply certain functional requirements to enforce the rules.>

# Other Requirements

<Define any other requirements not covered elsewhere in the SRS. This might include database requirements, internationalization requirements, legal requirements, reuse objectives for the project, and so on. Add any new sections that are pertinent to the project.>