SyncBox

Version <1.0>

Revision History

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| --- | --- | --- | --- |
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| 18/Jan/21 | 1.0 | Initialize | Altay Brusan |
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# Introduction

This document includes the purpose, scope, definitions, acronyms, abbreviations, references, and overview of this **Risk List**.

## Purpose

Analyze the risks associated with SyncBox.

## Scope

The project associated with this document is SyncBox, its firmware, and the device boxing.

## Definitions, Acronyms, and Abbreviations

SyncBox: Synchronization Box

## References

F. A. Durmaz, A. Brusan and C. Ozturk, "Unified Open Hardware Platform for Digital X-Ray Devices; its Conceptual Model and First Implementation," in IEEE Journal of Translational Engineering in Health and Medicine, vol. 8, pp. 1-11, 2020, Art no. 1800311, doi: 10.1109/JTEHM.2020.3000011.

## Overview

In the following the risks that could directly affect on the project progress and its success are enlisted. The technical detailed risks are not included.

# Risks

## GPIO\_PROTECT

### Risk Magnitude or Ranking

High

### Description

The GPIO pins are not standard. The communication logic may happen at different voltages and direct or inverse logic.

### Impacts

could cause permanent or serious damages to the circuit.

### Indicators

The SyncBox does not react to the GPIO channel

### Mitigation Strategy

Design special protection circuit to avoid hazard.

### Contingency Plan

replace the circuit or if possible switch to another serial communication busses.

## PWR\_PROTECT

### Risk Magnitude or Ranking

High

### Description

The input power is provided by an external 12 V 4 A AC/DC adaptor. The input power could exceed this limit.

### Impacts

could cause permanent or serious damages to the circuit.

### Indicators

Magic smoke!

### Mitigation Strategy

Be design, such that the input ranges should be explicitly written on the plug.

### Contingency Plan

replace the circuit.

## INACCUR\_FOOTPRN

### Risk Magnitude or Ranking

High

### Description

processing units such as FPGA, CPU, GPU, or power management ICs may have not self-descriptive footprint or description.

### Impacts

The circuit may crash.

### Indicators

Failed to make the circuit.

### Mitigation Strategy

for all processing chipsets the footprint should be confirmed by design. This include studying the similar product that used that component or asking the manufacturer for extra information.

### Contingency Plan

replace the circuit.

## TEMP\_LIMT

### Risk Magnitude or Ranking

Medium

### Description

The environment temperature may exceed the range in which the system works.

### Impacts

could cause the data lost.

### Indicators

system could reset automatically.

### Mitigation Strategy

select components that works in the range of the target environment (radiology room) and considering cooling fan in the system.

### Contingency Plan

cool down the system.

## EMC\_Boundary

### Risk Magnitude or Ranking

High

### Description

The SyncBox should be able to pass the EN-55011 EMC test requirements.

### Impacts

not suitable to introduce to market.

### Indicators

the certified body will reject the device with reasons of the rejection.

### Mitigation Strategy

Apply multi-layer PCB with ground plate, component positioning should follow the best practices, apply decoupling capacitors, match the impedance of the traces with the standards.

### Contingency Plan

redesign the circuit.