SECURE ON-SITE TECHNOLOGIES

12 October 2014

Dr. Andrew Rawicz
School of Engineering Science
Simon Fraser University
Burnaby, BC V5A 1S6

Re: ENSC 440 Functional Specification for Secure On-Site wireless package storage solution (SOSbox)

Attached is SOS Technologies' *Functional Specification for the Secure On-Site box (SOSbox)*. This document will outline the product specifications and requirements. The guidelines set forth in this document will be used as a source of reference for the proof of concept, prototype, and production product development phases. Specific requirements for key aspects of the product such as software, electrical, mechanical, physical, environmental sustainability, and safety will be addressed and clarified. A list of related engineering standards is also presented.

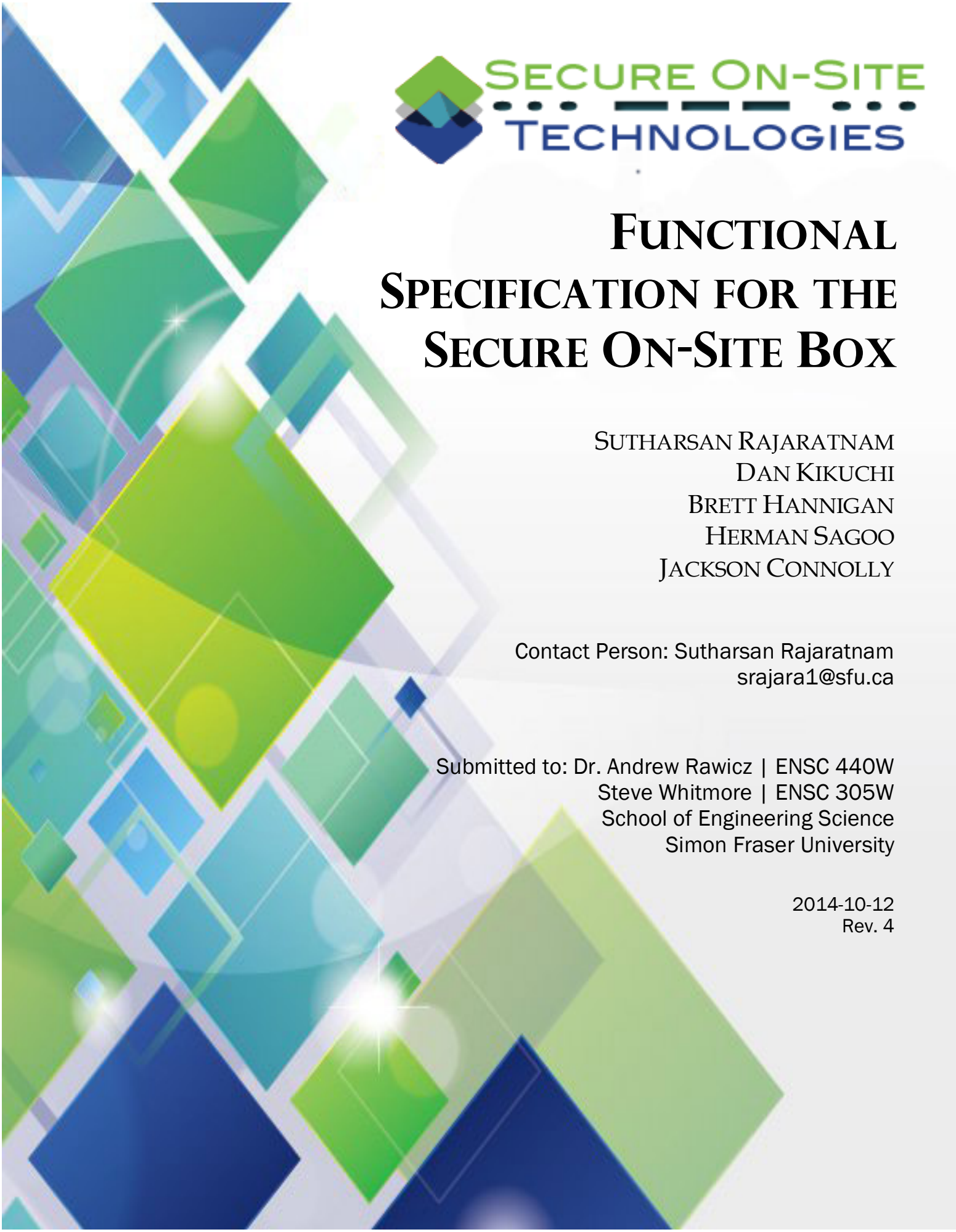
Our goal at SOS Technologies is to create an efficient, reliable, secure, and technologically advanced solution for 21st century parcel delivery. The company takes into account all requirements and creates innovative products with full compliance with established engineering standards.

SOS Technologies is comprised of five engineering science students: Brett Hannigan, Dan Kikuchi, Herman Sagoo, Jackson Connolly and Sutharsan Rajaratnam. With members specializations in different options such as biomedical, electronics and systems engineering gives us the unique skill sets to address problems in new and innovative ways. Please feel free to contact me by email at srajara1@sfu.ca or by phone at 604-323-4647.

Sincerely,

Sutharsan Rajaratnam
President and CEO
Secure On-Site (SOS) Technologies

Enclosure: Functional specification for the Secure On-Site box



Functional Specification for the Secure On-Site Box

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1 Executive Summary

Since its inception, the Internet has changed many things about how we interact with the world around us. In particular, online shopping has become the preferred purchasing method for many individuals and the meteoric rise of companies like EBay and Amazon is a testament to this change. This changing marketplace has also had the effect of spurring growth in traditional parcel service companies.

At Secure On-Site Technologies, we understand the substantial business opportunity in this area and have devised a product offering that takes full advantage of it. Our Secure-On Site box will enable individuals who frequently shop online to receive packages without having to be at home during business hours. By taking advantage of the user's Internet connection and a dedicated embedded hardware platform, we intend to build a solution that will save time and money for both the couriers and consumers in an evolving marketplace.

The development of the SOSbox solution will go through three phases: proof-of-concept, prototype and production. We intend to introduce additional capabilities with each development phase and reduce cost where possible. In this document, we have addressed all the functional specifications of the product. We have provided details, prioritized specific requirements for each development phase, and indicated possible additional capabilities going forward. The highest priority for us is the development of the proof-of concept system. Further development will only occur when all the proof-of-concept requirements have been met.

The mandatory requirements for the proof-of-concept will cover all areas of the project from mechanical, hardware, and software systems to box construction, safety, sustainability, and environmental impact.

Table of Contents

List of Figures

List of Tables

Glossary

C2C	Cradle-to-cradle.
CAD	Computer-aided design.
Camera feed	Real-time still photo or video streaming from the camera.
Client	Software that accesses a service made available by a server.
DAQ	Data acquisition.
Distributed file system	Telecommunications network that allows computers to exchange data (Israel, 1978).
FEA	Finite element analysis.
FOV	Field of view.
IoT	"Internet of things".
IP53	Ingress protection: dust protected, protected against spraying water (American National Standards Institute, 2004).
MBDC	McDonough Braungart Design Chemistry
MTTF	Mean time to failure.
Ping	A small request done by the origin device to detect the presence of a destination host on a network.
PoC	Proof-of-concept.
PROD	Production model.
PROTO	Prototype.
QR	Quick response.
Server	Software capable of accepting requests from the client and giving responses accordingly.
Subscriber	An active, authorized client application registered with the server.
Thread	The smallest sequence of software instructions managed independently by an operating system scheduler.

2 Introduction

The SOSbox is a secure mail delivery receptacle designed by Secure On-Site Technologies to accept packages personally and remotely from a mobile device. The product is composed of a metal box with actuators and sensors hidden in the interior. The hardware transmits to software on a mobile smartphone alerting the user when a package has arrived. This functional specification will define many requirements for the safe and efficient operation of the product. The design will take software, electrical, mechanical, physical, exterior environmental, and sustainability into consideration while complying with various appropriate standards to deliver a safe and reliable product.

2.1 Scope

This document covers the high-level functional requirements for the Secure On-Site Box. Section 3 lists some of the requirements that must be implemented in the proof-of-concept device and additional features planned for the subsequent prototype and production versions.

2.2 Intended Audience

The intended audience for this document is the engineering team at Secure On-Site Technologies. It serves as a guideline for the design engineers of each department. The project manager may use it as a benchmark for progress from design through production. The quality assurance team and test engineers may use the document to verify that the system correctly carries out its intended functions. Compliance to standards, safety guidelines, and user interface testing to eliminate human factors are further areas to which this document pertains.

2.3 Requirement Nomenclature

Throughout this document, the functional requirements are listed by category, reference number, and priority level as shown in Table 1, below:

Table 1: Details of functional requirement numbering format.

[	Category Abbreviation		Number	-	Priority Level	]
	SY	General system	Requirement reference number, increments for each requirement.		**H** High priority, functionality intended for proof-of-concept device.	
	PH	Physical device				
	ME	Mechanical				
	EL	Electronics				
	SS	Software, server side			**M** Moderate priority, functionality intended for proof-of-concept device, time permitting.	
	SC	Software, client side				
	EN	Environmental conditions				
	SU	Sustainability and safety			**L** Low priority, functionality intended for production device only.	
	ST	Engineering standards				

3 System Requirements

3.1 Entire System

3.1.1 Overview

The SOSbox system design can be modeled in a high-level functional diagram as shown in Figure 1:

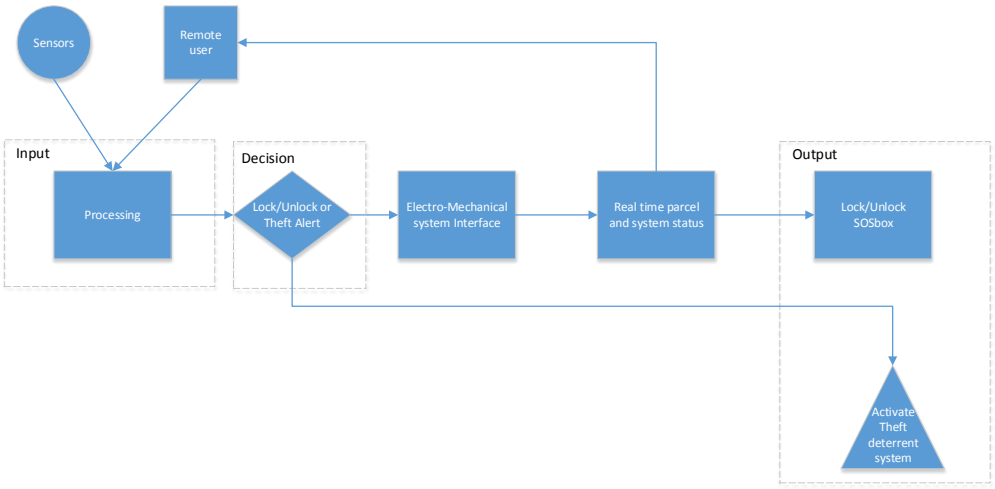

Figure 1: The high-level functional block diagram of the system.

The production version of the SOSbox will enable owners to remotely manage parcels deliveries by couriers in a convenient, cost effective and secure manner. The system will integrate with courier and merchant tracking systems to provide automated safe, secure, on-site storage of parcels without client involvement. Additional functionality will provide on demand real-time status and climate control for sensitive parcels. The physical design of the storage system will allow for safe and hassle-free drop off for the courier as well as provide significant security for the parcel placed within with electronic and mechanical theft deterrence capabilities.

To this end, the primary objective is to implement a proof-of-concept (PoC) SOSbox system that enables secure remote parcel retrieval. Due to current time and budgetary constraints, the focus will be on development of essential hardware (ARM-based development platform, camera, accelerometer, Wi-Fi module, speakers, and other visual systems for theft deterrence) and software necessary for demonstration purposes. Additional capabilities listed in Table 2 will be included (as indicated) in the prototype and production versions of the SOSbox system. The two-way communication between the remote user and the SOSbox system will be demonstrated over a local Wi-Fi network for proof-of-concept implementation and will later be expanded to any wireless connection over the internet. The dimensions of the SOSbox will be primarily determined by the need to accommodate over 90 percent of larger than normal parcels and in part by the space required for the required electronic and mechanical hardware.

One significant aspect of the system is the software development required to handle, process and manage the sensors, electronic and mechanical systems and real time communication between the SOSbox system and a remote user. Most of the development work will focus on perfecting flawless execution on the software side so that the intelligence necessary to deliver on our essential requirements for the proof-of-concept system can be met.

3.1.2 Development Cycle

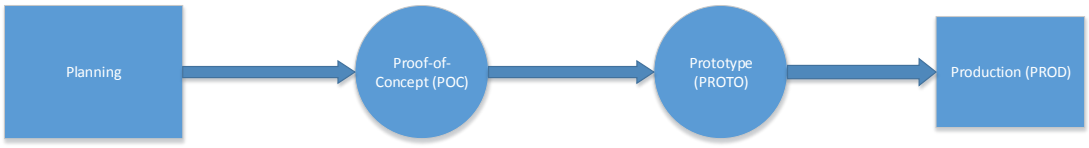

Figure 2: General overview of SOSbox functional development.

There are three major phases anticipated in the device development process. The proof-of-concept device will encompass the major connectivity and security features as seen in Table 2. These are the minimum requirements for the device, more functionality may be added if budget and time constraints allow. The

prototype device will add the next stage of features such as backup power and parcel identification abilities. The production version will implement the lowest priority features such as home security system integration and interior temperature control. It will also fully comply with the environmental specifications and all the listed standards.

Table 2: Key SOSbox functionality goals and justification for development cycle.

Product Version	Functionality	Justification
PoC	Wireless capability to access the local network and devices.	• Prerequisite for any IoT enabled capabilities such as remote control and real time communication with smartphone.
PoC	Secure locking mechanism with automated alarm system and remote surveillance capability.	• Theft deterrence capability for security of stored parcel. • Increased customer satisfaction and courier trust for our product.
PoC	Parcel detection and Identification capabilities.	• Enables remote identification of stored parcel and provides necessary information to the device's climate control system.
PROTO	Redundant power supply with optional wired connectivity.	• Provides enhanced security and mobility of the SOSbox system. • Self-sufficiency in case of power failure without compromising the theft deterrence system.
PROD	Real time integration with courier tracking system and payment.	• Enables courier peace of mind by providing real-time updates on the status of the parcel in the SOSbox and allows payment of duties or shipping fees.
PROD	Integration with third-party home security system.	• Enables SOSbox system to fully integrate with existing third party home security systems and services (saves costs by reducing unnecessary duplication).
PROD	Climate control system for temperature and humidity.	• Provides regulated environment for sensitive parcels. • Especially useful in extreme environments.

To be specific, the requirements that encompass the system as a whole are:

[SY01-H] The user's mobile device shall be notified when the exterior camera detects the courier's arrival.

[SY02-H] Access to the interior compartment shall be granted either remotely via the client's mobile device or by scanning of a QR code by the courier.

[SY03-H] The client's mobile device shall have a one-way video feed from the exterior camera.

[SY04-H] Feedback to the courier about door lock and access status shall be provided using LEDs.

[SY05-H] The device shall detect intrusion or unauthorized access and notify the client as well as sounding an alarm.

[SY06-L] The system shall have a MTTF of 1 000 000 hr in standby conditions.

- This value is chosen to achieve a probability of failure of less than 5% given daily use for the design life of 5 years.

3.2 Physical

The physical requirements are focused on the enclosure design and discuss the dimensions, materials, physical security attributes, and construction methods. Figure 3 depicts a dimensioned drawing of the exterior of the device.

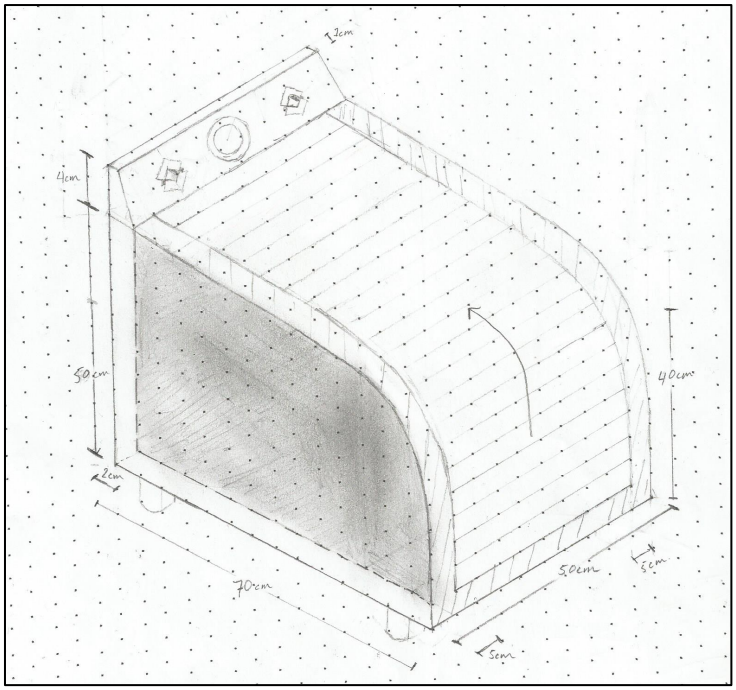

Figure 3: An artist's rendition of the SOSbox enclosure.

[PH01-H] The enclosure footprint shall be square with side lengths of 50 cm.
[PH02-H] The enclosure exterior height shall measure 60 cm.
[PH03-H] The enclosure interior dimensions shall be large enough to accept over 90% of parcel sizes and at least as large as the Canada Post community mailbox parcel compartment.
[PH04-H] The enclosure shall be elevated on legs of approximately 5 cm to prevent dirt and water from collecting beneath it.
[PH05-H] The proof-of-concept device shall have a frame made of pressure-treated wood.
[PH06-M] The device shall have a sheet metal exterior for increased durability and better weatherproofing.
[PH07-M] The enclosure shall be water, dust, mildew, and corrosion resistant.
[PH08-M] The access door shall be made of articulated metal panels with rubber backing and seals.
[PH09-L] The interior of the enclosure shall be lined with padded material.
[PH10-L] The enclosure shall have a secure attachment point to lock it in position and reduce the chance of theft.
[PH11-L] The interior compartment shall be temperature controlled to between 0 °C and 30 °C
[PH12-L] The entire system shall weigh between 15 kg to 20 kg.
[PH13-L] The system shall look appealing while standing in one's doorstep.

3.3 Mechanical

The mechanical requirements primarily cover the automated access door and supporting actuators and linkages.

[ME01-H] The access door shall open, close, and lock automatically.
[ME02-H] The exterior camera shall be positioned to have a FOV that captures an average person.
[ME03-M] The door shall retract without intrusion into the chamber.
[ME04-M] High forces applied to the enclosure shall be detected to trigger an anti-theft alert.
[ME05-L] The door actuation subsystem shall operate dependably for an average of at least 35 000 cycles.
- This value is chosen to achieve a probability of failure of less than 5% given once-daily use for the design life of 5 years.

3.4 Electronics

The electronics subset of requirements describes the power supply, microcontroller, sensor interface, camera interface, actuator driver circuitry, and electrical safety aspects of the device.

[EL01-H] The power supply shall provide fused and stable +5 V and +12 V outputs and be able to power all components of the SOSbox.
[EL02-H] The circuits and chassis shall be properly grounded.
[EL03-H] The circuits shall have accessible test points for troubleshooting and after-market repair.
[EL04-H] The circuits shall be made on proto-boards with no loose connections or cold solder joints.
[EL05-L] The electronics shall be on a custom printed circuit board.
[EL06-L] The power supply shall be integrated into the enclosure and not a "wall-wart" style adapter.
[EL07-L] The production device shall have a back-up power supply, made of a battery charged using mains or solar power.
[EL08-L] The power cord shall be tamper resistant and have a length of at least 2 m.

3.5 Software

This part of the document is divided into two major sections, the first is a full description of the on-site (delivery location) server software, and the second will cover both the desktop and mobile client applications.

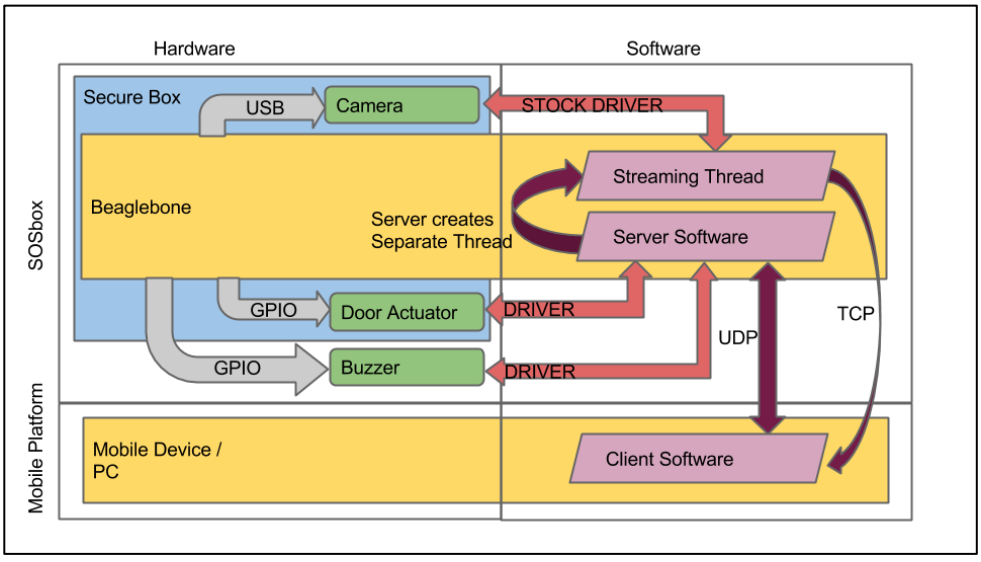

Figure 4: The interaction between the mobile device client software and server software running on the Beaglebone embedded system in the SOSbox.

3.5.1 Server Overview

The server is responsible for the following functions that manage controlled hardware:

- Controlling the SOSbox locking mechanism.
- Reading and interpreting the camera feed.
- Reading input from the buzzer.

Additionally, it must manage subscriber queries involving:

- Responding to ping requests from all subscribers.
- Managing a database of subscriber preferences.
- Sending alert messages to all relevant subscribers.
- Establishing a streaming link as needed with subscribers.
- Establishing two-way voice communication between a subscriber and the SOSbox hardware.

3.5.2 Server Requirements

[SS01-H] The server shall be able to unlock the box when an authorized when an authorized subscriber requests it (see [SS08-H]).

[SS02-H] The server shall be constantly screening the camera feed for unusual activity. It must also send notifications to all applicable subscribers when such activity is observed (see [SS07-H]).

[SS03-H] The server must send alert notifications to all applicable subscribers when buzzer activity is detected (see [SS07-H]).

[SS04-H] The server shall respond to ping requests from all subscribers in a timely fashion (to be precise, before the ping request timeout). This function ensures subscribers are notified if the server is offline for any reason.

[SS05-H] The server shall keep track of both all registered subscribers (clients with permission to access the server, a white-list) and all currently active subscribers.

[SS06-H] The server shall read the QR code on a parcel using the camera.

In addition, the server must keep key information about each subscriber preferences including but not limited to:

- Which alerts, if any, they wish to receive.
- Whether to notify them of missed alerts.
- Whether that subscriber has permission to access the audio/video feeds and unlocking functions.

[SS07-H] The server shall broadcast alerts to all applicable subscribers.
[SS08-H] The server shall be capable of receiving, interpreting and acting on valid requests from users. These requests include:
- Changing user preferences (see [SS07-H]).
- Unlocking the SOSbox (see [SS04-H]).
- Establishing a streaming Video connection between itself and the client (see [SS02-H], [SS09-H]).
- Establishing 2-way voice communication between itself and the client.

[SS09-H] The server shall establish a streaming link with any number of subscribers when requested.
[SS10-L] The server shall establish 2-way voice communication with authorized subscribers when requested, with the caveat that only one voice communication can occur at one time. The server must also notify authorized users requesting a voice call if one is already in progress.

3.5.3 Client Requirements

Both clients (the mobile and the desktop applications) must fulfill the following functions relating to managing the connection to the server and receiving server broadcasts:

[SC01-H] The client software shall regularly sending ping messages to the server to detect connection failures.
[SC02-H] The client shall receive alert messages from the server.

Additionally, the clients shall relay user inputs as described below:

[SC03-H] The client software shall be responsible for submitting locking /unlocking requests to the server.
[SC04-H] The client shall send updated subscriber preferences.
[SC05-H] The client shall relay streaming audio /video requests.

Finally, the client shall communicate to the user in the following ways:

[SC06-H] The client shall notify the user of alerts (both graphically and using vibration, sound, etc. subject to user preference).
[SC07-H] The client software shall render the camera feed in real-time.

3.6 Environmental

The environmental requirements define the range of ambient conditions that the device must operate in. Due to its nature as an outdoor device, the SOSbox must be unaffected by a broad range of temperatures, humidity levels, elevations, and precipitation amounts.

[EN01-L] The device shall remain operational at temperatures from -40 °C through 50 °C.
[EN02-L] The device shall withstand temperature cycling conditions of up to 0.3 °C/min for the design life.
[EN03-L] The device shall remain operational at relative humidity levels from 0% to 100%.
[EN04-L] The device shall remain operational at elevations from sea level to 3 000 m.
[EN05-L] The electronics shall be housed in a sealed, cool, and dry sub-enclosure.

3.7 Sustainability and Safety

3.7.1 Sustainability Overview

The product lifecycle begins with the design, which must take into account all considerations including sustainability and environmental consciousness. For this, it is beneficial to look into cradle-to-cradle design methodologies. Cradle to cradle (C2C) is an approach where the design encompasses the entire lifecycle of the product and ultimately aims to make it waste free (Lovins, 2008). The SOSbox will use galvanized steel for most of its box, which makes up the majority of its body. Many of the advantages of galvanized steel come from the low environmental impact it produces due to its reliance on two very common metals, steel and zinc. Steel and zinc are both infinitely recyclable materials that that lose no physical or chemical properties in the recycling process. Furthermore, approximately 30% of the world's zinc and close to 100% of the world's steel comes from recycled sources (American Galvinizer's Association).

Using this material is in line with the C2C methodology as the end product will find its way back in some form to a new product in the form of recycling. Combined with its high durability and lifetime, this material is the ideal choice for the bulk of the SOSbox. Internal parts will use mainly C2C certified products by the MBDC (Lovins, 2008) to operate inner workings. This ensures that the parts used within the SOSbox are all individually environmentally friendly and have had work done to ensure it has a useful application after the product's has hit its end in the lifecycle. It should be noted that the US Postal Service is one of

the companies that actively participates in C2C certification program, which is one of the primary target clients aimed at with the inception of the SOSbox.

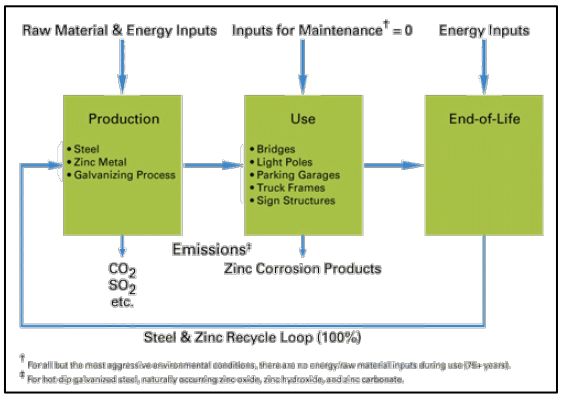

Figure 5: Lifecycle of Galvanized Steel (American Galvinizer's Association).

Usage of the SOSbox in the standby state does not use any input resources other than a small input current. While it would be ideal to not use any current while it is not receiving a package, it is almost impossible to do so since the device requires that it continually wait for a signal to activate. The SOSbox will ensure to use minimal current under resting conditions to compensate.

3.7.2 Safety Overview

The number of safety considerations for the product is low due to minimal moving parts and low complexity. However, there are dangers within the device if not careful. The standards for this are defined below and are part of the design considerations. These standards are set in place to limit the number of accidents that may occur. However, there are methods of use that may not be acknowledged by the standards set. In general, methods of proper use and warnings for improper use will be displayed in the User's manual.

As with all electrically powered products, the danger of electrocution is present. Figure 6 demonstrates the number of US electrocutions due to household products by year (Hnatov, 2012). The device must be properly grounded at all times as well as have tamper-proofing on its electrical system and power cord.

Physical accidents may occur due to design errors. Sharp corners may cause injury when hit against, especially for young children near the device. Additionally, the door of the device is mechanized, which may cause physical harm when it closes if there is no safety override lockout. The hardware shall have safety measures, such as infrared sensors, for the door of the device so a limb or parcel cannot be trapped underneath the closing door.

National Estimates of Electrocutions Associated with Consumer Products, 2002–2009

Year	NCHS Electrocution Records	CPSC Electrocution Records	Estimated CPSC In-Scope Records*	CPSC Staff National Estimates#	Percent of CPSC Electrocution Records that are In Scope
2002	432	397	51	60	13%
2003	377	344	56	60	16%
2004	387	358	56	60	16%
2005	394	350	83	90	24%
2006	390	348	41	50	12%
2007	370	321	50	60	16%
2008	306	263	43	50	16%
2009	305	232	73	100	32%
Total 2002-2009	2961	2613	453	530	18%
Average 2007-2009	327	272	55	70	21%

* Estimated CPSC In-Scope Records represents proportionately scaled counts after allocation of electrocution incidents with unknown location and/or scope (see Appendix B for details).
# Estimates have been rounded to the nearest 10.

Figure 6: Electrocutions Associated with Consumer Products in 2009 (Hnatov, 2012).

3.7.3 Requirements

[SU01-H] Mains voltage connections shall be fused.
[SU02-H] There shall be no sharp edges on any user-accessible panels.
[SU03-L] The user manual shall include all warning labels.
[SU04-L] The device shall have a standby power consumption of at most 5 W.
[SU05-L] The exterior of the device shall use easily recyclable galvanized steel.
[SU06-L] The metal materials that are used in enclosure construction shall be from recycled sources.
[SU07-L] Internal components shall be cradle-to-cradle approved by the MBDC.
[SU08-L] Parts shall be chosen to have the lowest possible environmental footprint.
[SU09-L] A sensor shall prevent the automatic door from closing when an object is blocking its path.

3.8 Engineering Standards

3.8.1 Overview

There are two major groups of standards that the SOSbox must adhere to. The first are safety standards that define electrical safety, electromagnetic compatibility, and elimination of hazardous materials in manufacturing. The second group is functional standards that describe exactly how certain

standardized features are implemented. These features are communication via Wi-Fi, reading QR codes, and weatherproofing the enclosure.

3.8.2 Requirements

[ST01-L] The device shall comply with the CSA/UL 60950-1 "Safety of Information Technology Equipment" standard (Underwriter's Laboratories, 2007).

[ST02-L] The device shall adhere to the FCC 47 CFR Part 15 regulations for radio frequency transmission and the Canadian ICES-003 equivalent (Federal Communications Commission, 2010).

[ST03-L] For the QR code reading functionality, the device shall conform to the ISO 18004 "Automatic identification and data capture" standard (International Organization for Standardization, 2011).

[ST04-L] The hardware components implementing Wi-Fi connectivity shall conform to the IEEE 802.11n specification (Institue of Electical and Electronics Engineers, 2009).

[ST05-L] The device shall have a solid particle and liquid ingress protection rating of IP53 or greater as per the IEC 60529 "Degrees of Protection Provided by Enclosures" standard (American National Standards Institute, 2004).

[ST06-L] The electronic circuits and subcomponents in the device shall conform to the EU Restriction of Hazardous Substances Directive 2002/95/EC (European Commission, 2011).

4 System Test Plan

4.1 Components

Testing individual components prior to integration into the entire system is critical to reduce debugging time and increase system reliability. The intended placement of the SOSbox is outdoors for a design life of at least five years. It is important to note that the users of the device, with the exception of the mobile device application aspect, are usually postal workers who may not be familiar with how to operate the device. Thus, a simple, intuitive design is required that is not prone to failure due to misuse. To solve this problem, only a single-button control is found on the box exterior. Opening of the SOSbox is automatic after access is remotely granted or a QR code is scanned by sliding the parcel past the built-in surveillance camera. Rugged components are required due to the somewhat hostile target environment, inexperience of courier users, and possibility of physical tampering by unscrupulous individuals. Fortunately, with the use of high volume components and sturdy design of the enclosure,

component reliability should be high. The following methods of testing components are proposed:

- Use of standard instruments to bench test all component as they arrive.
- Performing of wear-in procedure to reduce "infant mortality" of electronic components. If possible, doing burn-in using absolute maximum specifications from each component's data sheet.
- Bench testing subassemblies such as the door motor controller and camera interface to detect workmanship deficiencies like cold solder joints and connection errors.
- Verification that the entire electronic system meets the design specifications prior to affixing it inside the enclosure.
- For the door opening and closing mechanism, creating CAD models and doing FEA modeling before fabrication.

4.2 Software

As software is notoriously difficult to debug, the code will be made modular individual parts can be debugged in parallel. Although the SOSbox system is not safety-critical, it is essential that a software issue does not compromise the security of the device. In the unlikely event of a software glitch or interrupted power or data links, the device will default to a locked, fail-safe condition. Although inconvenient, this will ensure that one's parcels are kept safe at all times. In the prototype and production versions of the device, the addition of a backup power source will ideally eliminate this compromise. Below are several steps that will be taken to test and debug the SOSbox software:

- Thorough testing of each portion of the code independently using many fringe conditions.
- Incorporation of a fail-safe state for power or data link loss.
- Running of the entire code base on the embedded system with other different background process to ensure it is unaffected by a decrease in available system resources.
- For the mobile application, testing on different mobile devices and with varying Wi-Fi or cellular signal strength.
- For the intrusion detection system, using a computer with a DAQ card to calibrate the accelerometer output and condition the signal to detect actual intrusion attempts while ignoring minor bumps.

4.3 System

Once all software and hardware components are tested, the system can be assembled in the enclosure. Given that the aforementioned subsystems have

been tested already, the main goals of the entire system testing are verifying that no unwanted effects are encountered due to the enclosure, ensuring that the enclosure can stand up to the environmental specifications, and reducing the effect of human factors. To do this, the following methods are devised:

- Testing samples of enclosure materials for their durability and corrosion resistance in a moist, salty environment for extended periods.
- Testing the door mechanism under a range of temperatures and with precipitation using an indicator in the parcel compartment to detect water intrusion.
- Checking functionality of the system with vibration applied to the chassis.
- Ensuring the enclosure does not cause high attenuation of the Wi-Fi signal using software on the embedded system and a reference PC.
- Using test subjects who are unfamiliar with the system to determine ease of use and possibilities of misuse.

5 Conclusion

In this document, we have presented and clarified the development process and product requirement for the SOSbox system. As in any product development, we anticipate some modifications to be made to the specifications listed in this document as development work progresses. Our goal at SOS Technologies is to create a solution that is cost effective, easy to use and technologically innovative. Furthermore, production versions of the product will incorporate environmentally sustainable manufacturing methods and rugged all-weather construction.

6 References

1. American Galvinizer's Association. (n.d.). *HDG Environmental Cost*. Retrieved October 8, 2014, from http://www.galvanizeit.org/hot-dip-galvanizing/is-galvanizing-sustainable/hdg-environmental-cost
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