



February 19, 2007

Lakshman One
School of Engineering Science
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Re: ENSC 440 Functional Specifications for a World of Warcraft Input Device

Dear Mr. One,

The enclosed document, *Functional Specifications for a World of Warcraft Input Device*, outlines InDev's decisions on the functional specifications of a device that would improve the comfort and health of World of Warcraft players.

Included in this proposal are a series of design decisions that have been made with respect to software, hardware, implementation and performance of the now named InDevil. Relevant information regarding standards and protocols is also outlined.

If you have any concerns or questions regarding this document, please contact me by email at ensc440@gmail.com or by telephone at 604-616-6227.

Sincerely,

A handwritten signature in black ink, appearing to read "W. Walczak", written in a cursive style.

W. William Walczak,
CEO
InDev Corp.

Enclosure: *Functional Specifications for a World of Warcraft Input Device*



Functional Specifications for a World of Warcraft Input Device

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Executive Summary

The mass proliferation of gaming amongst all age groups suggests that the gaming input device market is ready for young and ambitious engineers. We plan to fill the void that is a comfortable, ergonomic and natural gaming device and bridge the gap preventing all people interested in playing games but unable to with the current desktop setup. The World of Warcraft phenomenon provides the ideal gaming audience for a project that would give us an opportunity to attempt both.

The Input Devices (InDev) team has been working on the World of Warcraft input device for over a month, now coined "InDevil".

The development of InDevil will occur in two phases. The completion of the first phase will produce a device that will be usable for gaming and allow for easy interfacing with the gaming environment. The InDevil will have the following features:

1. Wireless connectivity with the gaming computer.
2. Ability to control the gaming environment without the confines of a two-dimensional desktop.
3. Easy integration with the host computer.

After the second and final stage of development InDevil will also:

4. Have a comfortable and ergonomic case that is easy to orient without visual inspection.
5. Be a fully usable consumer device.
6. Perform as a reliable consumer device.

The first phase of development of InDevil will be completed by May 2007.



Table of Contents

Executive Summary	2
Table of Contents	3
Introduction.....	4
Scope.....	4
Intended Audience	4
Objectives	4
System Requirements.....	5
System Overview	5
Physical requirements	5
General.....	5
Operating Conditions and Requirements	6
Serviceability & Reliability	6
Performance	6
Interface Requirements	7
Hardware Level Interface	7
Software Level Interface.....	8
Relevant Standards.....	8
Standards compliance	8
Documentation and User Training.....	9
Conclusion	10
Sources and References	10

Introduction

The InDev team is working to create our first product, the InDevil World of Warcraft input device. The InDevil will allow users a more efficient and comfortable control over their Warcraft experience. This document details the functional specifications for the first prototype stage of the InDevil (scheduled for completion before May 2007,) as well as some requirements for the production device.

Scope

This document describes the functional requirements for the prototype World of Warcraft (WoW) Input Device, herein known as the 'InDevil'. As the full scope of the production device has not fully been determined the functional requirements within are for the prototype device, only a partial set of functional requirements is defined for the production device.

Intended Audience

This document is to be used as a reference point for the design engineers working on the InDevil. The functional requirements will guide the design process, and constrain the available components used in its development.

Management will be able to refer to this document to determine the progress of the design engineers and gauge whether the design cycle is on schedule.

Investors will be able to compare the InDevil to competing input devices currently in development using this document.

Marketing will be able to use this document to develop promotional material.

Objectives

The following convention is used throughout this document to denote functional requirements:

[R#] A functional requirement

To denote the priority of each functional requirement, a number (*n*) will be appended to the front of each functional requirement. The symbol (*n*) shall be signify:

- (1) A functional requirement for only the proof of concept device.
- (2) A functional requirement for both the proof of concept device and the production device.
- (3) A functional requirement for only the production device.

System Requirements

System Overview

This section is intended to provide the reader with a brief overview of the World of Warcraft Input Device. The user's actions are detected by a motion sensor and processed by a microcontroller. The data is then sent via RF back to the computer where it is processed by the driver.

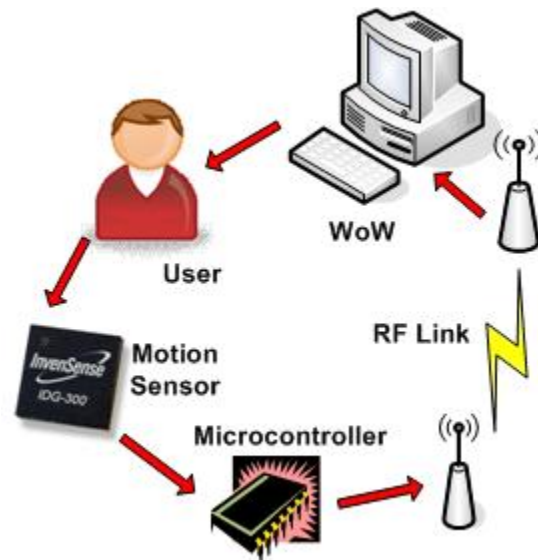


Fig 1. System Overview

Physical requirements

General

- R[1] (2) The InDevil must easily fit into the average users hand.
- R[2] (2) The device must be operable from a rested hand position on an armrest. The entire interface must allow the user to maintain proper posture and the correct angles in the hips, elbows, and wrists.
- R[3] (2) Must be able to place the device down and resume using it quickly.
- R[4] (2) The total weight of the device must not place significant strain on users hand.
- R[5] (2) The device must be shaped so the user can orient it in their hands quickly, easily and without visual feedback.
- R[6] (2) Buttons must have a natural mapping to the users natural hand positioning.

- R[7] (3) All the components of the production device will be contained within a rigid and not easily destructible housing.
- R[8] (3) Production device will not have small breakaway parts that could pose a choking hazard to small children.
- R[9] (2) Buttons on the device will provide an auditory feedback to indicate depression.
- R[10] (2) The shape of the directional and action buttons will require the user to perform minimal movement to active.
- R[11] (3) The device will be easily usable by both right and left handed players.

Operating Conditions and Requirements

- R[12] (2) The device will be able to operate between 0C to 40C.
- R[13] (2) The unit shall be capable of operating under all domestic humidity and pressure ranges.
- R[14] (2) The unit's heat dissipation shall be such that the exterior of the unit will not be more than 30C.

Serviceability & Reliability

- R[15] (2) The device will not be serviceable by the user.
- R[16] (3) The device shall meet a mean time between failures of at least 6000 hours.

Performance

- R[17] (3) The production device must have a power source that lasts two months of regular use.
- R[18] (2) The device shall be able to communicate with the computer at a minimum of 100 kbps.
- R[19] (3) There shall be at most a .5 second delay between user input and computer response.

- R[20] (2) The transmitter will operate up to a distance of 10 meters away from the receiver.
- R[21] (3) The device shall be able to survive a brutal 12 hour WoW dungeon raid.
- R[22] (3) The production device shall be able to detect periods of rest and operate in a low power mode until the device is called into operation.

Interface Requirements

The InDevil will provide functionality to accommodate two intended modes of use. The first and most frequent mode will be “Relaxed” mode, where the user will sit back in his chair and use only the InDevil to interact with WoW. “Relaxed” mode will be the user’s interaction of choice for typical outdoor exploring and adventuring. The second, more intense mode intended for more involved combat will be “Hardcore” mode where the user will use the InDevil in one hand and use the other hand to access extra game functions and actions via the standard computer keyboard.

Hardware Level Interface

- R[23] (2) The device shall have sufficient functions (whether through buttons, actions, or a combination) to perform at least 15 in-game actions and abilities – a necessity for “Relaxed” mode.
- R[24] (2) The device will allow for direct access to the character’s movement functions.
- R[25] (2) The device will replace the standard cursor functions of a mouse, and be capable of precise and responsive interaction with game menus.
- R[26] (2) The device will have provisions to mimic the left-click, right-click, and scroll wheel functions present on a mouse.
- R[27] (2) The device’s buttons shall not use more than three unique positions or functions per finger, with the exception of the thumb.
- R[28] (2) The device will feature direct access to voice chat functions for a program such as TeamSpeak or Ventrilo.
- R[29] (2) The device will allow for easy homing by the user, so that he may quickly rest the device, access in-game text chat using the keyboard, and quickly return to the “Relaxed” mode of play using only the InDevil.

- R[30] (2) The device will be capable of access to in-game targeting functions, such as “Target nearest hostile,” “Target Party Member,” “Target Self,” etc.

Software Level Interface

- R[31] (2) The device’s drivers shall operate with Microsoft Windows XP/2000.
- R[32] (3) The device’s drivers shall also support Apple OS X and Microsoft Windows Vista.
- R[33] (3) The device shall be bundled with a WoW interface add-on to facilitate easier customization than standard one-at-a-time key binding.

Relevant Standards

The InDevil will be comply with all applicable standards set out by IC, CSA, FCC, IEC, and other standards bodies.

- R[34] (3) The production device must be wireless.
- R[35] (2) The Radio Frequency emissions will not exceed 10 mW.
- R[36] (2) The transmission algorithm will have error checking to ensure that data has been successfully transmitted.

Standards compliance

- R[37] (2) Safety
- CSA C22.2 No. 1010-92 - Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use [1]
 - IEC 1010-1:1990 +A1:1992 +A2:1995 [2]
 - UL 3111-1
- R[38] (2) Wireless (ISM Band) Standards
- ETS 300 328 - Technical characteristics and test conditions for data transmission equipment operating in the 2,4 GHz ISM band and using spread spectrum modulation techniques (Europe) [3]
 - ETS 300 826 – Electro Magnetic Compatibility (EMC) Standard for 2,4 GHz Wideband Transmission Systems and High Performance Radio Local Area Network (HIPERLAN) Equipment (Europe) [3]
 - FCC CFR 47 Part 15 Subsection 247 - RADIO FREQUENCY DEVICES Radiated Emission Limits (US) [4]
 - FCC CFR 47 Part 18 - INDUSTRIAL, SCIENTIFIC, AND MEDICAL EQUIPMENT (US) [4]
 - IC RSS 139 - Licensed Radio communications Devices in the Band 2400-2483.5 MHz (Canada) [5]

- IC RSS 212 - Test Facilities and Test Methods for Radio Equipment (Canada) [5]
- IEC-60950 - SAFETY OF ELECTRONIC EQUIPMENT WITHIN THE FIELD OF AUDIO/VIDEO, INFORMATION TECHNOLOGY AND COMMUNICATION TECHNOLOGY (Int.) [2]

R[39] (2) Electromagnetic Compatibility Standards

- EN 55011:1991/CISPR 11:1992 +A2:1992 (Group 1, Class A) – RE/CE
- EN 50082-1:1997 – Radiated, EFT/Burst, ESD Surge, Conducted, Voltage dips/interrupts

Documentation and User Training

The immediate market for the InDevil will be avid WoW gamers looking to enhance their user experience and gain more from their gaming experience. The eventual goal is to gain mass acceptance as the easiest and best way to interface with your character and gaming environment. With these users in mind, the following requirements have been set for documentation and user training.

- R[40] Documentation for the production version of the user manual will consist of a manual of sufficient length, 30 pages, with instructions written in English, French, German, Korean, Spanish, and Japanese (The largest WoW demographics).
- R[41] The manual will be written for an audience with minimal WoW experience with highlighted steps for those with extensive experience.
- R[42] The manual will contain advanced topics on button mapping configuration, default behavior modification, software updating and detailed device information.
- R[43] The manual will contain a troubleshooting section and a device characteristics list.
- R[44] Additional documentation will be provided on InDev's website and will consist of FAQs and whitepapers, as necessary.
- R[45] No user training should be necessary for the use of this device.
- R[46] Users of the prototype device will be instructed by the project developers, or use the device under the supervision of the project developers.

Conclusion

This document has outlined, in detail, all of the functional requirements for building the prototype World of Warcraft Input Device. The design specifications will be created to reflect the constraints and requirements which have been outlined.

The requirements for the proof of concept device (1) and (2) will be implemented in the device to be completed in April 2007. The production requirements (3) will be integrated in a second development stage, commencing once the proof of concept device has been demonstrated.

Sources and References

[1] Canadian Standards Association (CSA)

<http://www.csa.ca>

[2] International Electrotechnical Commission (IEC)

<http://www.iec.ch>

[3] European Telecommunications Standards Institute (ETSI)

<http://www.etsi.org>

[4] Federal Communications Commission (FCC)

<http://www.fcc.gov>

[5] Industry Canada (IC)

<http://strategis.ic.gc.ca/engdoc/main.html>