**Software requirements analysis**

**Model: i-DOLPHIN**

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**Revision History**

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# Software Requirements Specification (SRS)

# Hardware Requirements

## Microprocessors

### Camera Initialization (RH-01)

Initailization of camera specification.

카메라 사양 초기화 작업

### ROM Initialization (RH-02)

Initialization and Save preperation of bin file generated by Firmware

Firmware에서 생성된 bin 파일을 ROM에 저장할 준비 및 초기화 작업

## Memory device

### Hard Disk (RH-03)

Save image and video

이미지 및 동영상 저장.

### ROM (RH-04)

Upload 512Kbytes (FPGA Bin File)/64KBytes file on ROM to operate Hardware.

Hardware를 구동하기 위하여 ROM에 파일을 저장한다. 512KByte (FPGA Bin File) / 64KByte (USB)

## Sensors

### Camera (RH-05)

Device to acquire image in substance.

실질적으로 이미지영상을 획득하기 위한 디바이스.

### Optical fiber (RH-06)

Optical fiber to supply a source of light to camera.

어두운 곳을 밝게 비추기 위한 fiber

## Energy sources

### Camera (RH-07)

There is need to supply power to generate camera for image aquiring.

영상 획득을 위하여 카메라가 필요하다.

## Safety features

### Prevention of overcurrent (RH-08)

In certain situation, Overcurrent may be generated. To prevent this point,, implement circuit.

특수한 상황일 경우 과전류가 발생이 될 수 있다. 이점을 방지하고자 회로로 구현 하였다.

### Noise (RH-09)

전류 및 기타 회로를 통하여 잡음이 발생이 된다. 이러한 잡음을 통하여 영상에 영향을 준다.

## Communications

### Save

* + - 1. Image (RH-10)

Save the image. File format is .jpeg.

이미지 저장을 한다. 파일 형식은 JPEG이다.

* + - 1. Cine (RH-11)

Save the video. File format is .avi.

동영상 저장을 한다. 파일 형식은 avi이다.

### Rotation (RH-12)

Roation of screen.

화면 방향전환

### Brightness (RH-13)

Adjustment of monitor brightness.

화면 밝기 전환

### Folder (RH-14)

Specification of location to be saved file.

저장된 파일 위치 지정

### Zoom (RH-15)

Zoom-in and Zoom-out function

화면 확대 및 축소 기능

### AEC (RH-16)

AEC를 조절할 수 있도록 가능

# Programming Language Requirements

## Program Language

### Main UI & Sequence (RP-01)

Editor : MS visual studio

Debugger : MS visual studio

Compiler

C compiler : MS visual studio

Assembler : MS visual studio

Linker : MS visual studio

### Firmware (RP-02)

Editor : FPGA

Compiler Xilinx FPGA

Assembler : Xilinx FPGA

Linker : Xilinx FPGA

## Programming Tools and Library (RP-03)

Microsoft visual 2013

## Program Size (RP-04)

About 80 MB

# Interface Requirements

## PC (RI-01)

Operate device connected with hardware

H/W와 PC에 연결하여 제품 구동

## Monitor (RI-02)

The device to display image to user

이미지 영상을 사용자에게 표시하기 위한 장치

## Mouse (RI-03)

Control software by mouse

사용자가 마우스로 조작할 수 있다.

## Keyboard (RI-04)

Control software by mouse

사용자가 키보드로 조작 할 수 있다.

# Software Performance and Functional Requirements

## Device limitations due to software (RS-01)

|  |  |  |
| --- | --- | --- |
| Device | Description | Range |
| Display monitor | Display device supporting min.  Resolution 1280\*1024. | -Monitor: 15 inch |
| CPU | iDOLPHIN Viewer is used for efficient image processing. | -Support iDOLPHIN-Viewer |
| RAM | Minimum memory size for efficient image reconstruction is required. | - 4 GB or above |
| Mother board | - PCI slot for plugging SICC card | -VGA slot: 1 or above |

## Internal software tests and checks (RS-02)

|  |  |  |
| --- | --- | --- |
| Check items | Description | Valid condition |
| License validity | Check license validity to be used by permitted users only. | - Within the term of validity  - Permitted system |
| DB compatibility | Check DB fields for DB compatibility. | - The presence of field supported |
| Disk space | - Check available memory size of disk frequently and display the warning message continuously if the remaining capacity is not enough. | - Less than 10% for free space |

## Error and interrupt handling (RS-03)

Software handles no interrupt and internal timer interrupt.

## Fault detection, tolerance, and recovery characteristics (RS-04)

Status of USB connection, and do re-connect if connection is lost. Software checks the validity of image and discards it if not valid.

## Safety requirements (RS-05)

|  |  |
| --- | --- |
| Item | Requirement |
| FPS | When excessive framerate is generated, data loss occurs and the software is not worked normally. So average FPS must be maintained 35.  과도한 Framerate 발생시, Data 손실 및 정상적인 작동을 하지 않는다. 따라서 FPS를 평균 35로 나오도록 한다. |
| Overcurrent  과전류 | When overcurrent is generated, device may be stopped or break. Therefore the current must be set so that it is not excess.  과전류가 발생시, 디바이스가 멈추거나 고장이 날 수 있다. 따라서 일정 값이 넘지 않도록 설정을 한다. |

## timing and memory requirements

### System Boot Time (RS-06)

: ≤ 300 second

## identification of off-the-shelf software, if appropriate

### Version (RS-07)

Conduct version management systemically.

체계적인 Version 관리를 한다.

## Image Processing

### Brightness (RS-08)

Adjusting brightness

밝기 조절

### RGGB (RS-09)

Value of camera is converted RGGB in PC.

카메라에서 들어오는 RGB 값은 RGGB로 들어온다. 이 값을 통하여 RGB로 변환을 한다.

### Rotation (RS-10)

Conduct image processing to rotate screen.

화면 회전을 할 수 있도록 image processing을 한다.