LDR

Chapter 1

LDR Library Integration Guide

This guide provides instructions on how to integrate the LDR library into your STM32 project using STM32Cube IDE or any other compatible IDE.

1.1 Step 1: Download the library files

Download the following LDR library files:

1. `ldr.h` - The header file containing the function prototypes and necessary definitions.

2. `ldr.c` - The source file containing the function implementations.

1.2 Step 2: Add the library files to your project

Follow these steps to add the LDR library files to your project:

1.2.1 STM32Cube IDE

1. In STM32Cube IDE, open your STM32 project.

2. Navigate to the project tree in the "Project Explorer" tab.

3. Place the `ldr.h` file into the "Inc" folder (or the folder where header files are stored in your project).

4. Place the `ldr.c` file into the "Src" folder (or the folder where source files are stored in your project).

1.2.2 Other IDEs

1. Open your STM32 project in the IDE you are using.

2. Place the `ldr.h` file in the folder where header files are stored in your project (usually an "include" or "inc" folder).

3. Place the `ldr.c` file in the folder where source files are stored in your project (usually a "source" or "src" folder).

1.3   Step 3: Include the library header in main.c

In the `main.c` file of your project, add the following include statement at the beginning of the file, along with other include statements:

```
#include "ldr.h"
```

1.4   Step 4: Initialize the LDR in main.c(sets the calibration constants)

In the`main.c` function of your project, call the `LDR_Init()` function to initialize the LDR:

```
int main(void)
{
    // Initialize peripherals, system clock, etc.

    // Initialize LDR
    LDR_Init();

    // Other code
}
```

1.5   Step 5: Read analog light intensity in main.c

To read the analog light intensity using the LDR, call the `LDR_ReadAnalogLightIntensity()` function in your code:

```
int main(void)
{
    // Initialize peripherals, system clock, etc.

    // Initialize LDR
    LDR_Init();

    // Read analog light intensity
    float light_intensity = LDR_ReadAnalogLightIntensity(&hadc);

    // Other code
}
```

Again, `hadc` is a handle to the ADC peripheral that you should have already initialized in your project.

Chapter 2

File Index

2.1 File List

Here is a list of all documented files with brief descriptions:

Chapter 3

File Documentation

3.1 ldr.c File Reference

LDR Library Source.

```
#include "ldr.h"
```

Functions

- void LDR_Init (void)

    Initialize the LDR with calibration constants.
- uint32_t LDR_ReadADC (ADC_HandleTypeDef ∗hadc)

    Read ADC value from the LDR.
- float LDR_ReadAnalogLightIntensity (ADC_HandleTypeDef ∗hadc)

    Read analog light intensity using the LDR.

3.1.1 Detailed Description

LDR Library Source.

Author

Travimadox Webb @position Embedded Software Engineer @company Imperium LLC

Date

6th of May 2023

3.1.2 Function Documentation

3.1.2.1 LDR_Init()

```
void LDR_Init (
            void )
```

Initialize the LDR with calibration constants.

Initialize the LDR.

3.1.2.2 LDR_ReadADC()

```
uint32_t LDR_ReadADC (
            ADC_HandleTypeDef * hadc )
```

Read ADC value from the LDR.

Parameters

hadc	Pointer to an ADC_HandleTypeDef structure that contains the configuration information for the specified ADC

Returns

32-bit unsigned integer ADC value

3.1.2.3 LDR_ReadAnalogLightIntensity()

```
float LDR_ReadAnalogLightIntensity (
            ADC_HandleTypeDef * hadc )
```

Read analog light intensity using the LDR.

Parameters

hadc	Pointer to an ADC_HandleTypeDef structure that contains the configuration information for the specified ADC

Returns

Floating-point light intensity value

3.2 ldr.h File Reference

LDR Library Header.

```
#include "stm32f0xx_hal.h"
```

Functions

- void LDR_Init (void)

    Initialize the LDR.

- uint32_t LDR_ReadADC (ADC_HandleTypeDef *hadc)

    Read ADC value from the LDR.

- float LDR_ReadAnalogLightIntensity (ADC_HandleTypeDef *hadc)

    Read analog light intensity using the LDR.

3.2.1 Detailed Description

LDR Library Header.

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3.2.2 Function Documentation

3.2.2.1 LDR_Init()

```
void LDR_Init (
            void )
```

Initialize the LDR.

Initialize the LDR.

3.2.2.2 LDR_ReadADC()

```
uint32_t LDR_ReadADC (
            ADC_HandleTypeDef * hadc )
```

Read ADC value from the LDR.

Parameters

hadc	Pointer to an ADC_HandleTypeDef structure that contains the configuration information for the specified ADC

Returns

32-bit unsigned integer ADC value

3.2.2.3 LDR_ReadAnalogLightIntensity()

```
float LDR_ReadAnalogLightIntensity (
          ADC_HandleTypeDef * hadc )
```

Read analog light intensity using the LDR.

Parameters

hadc	Pointer to an ADC_HandleTypeDef structure that contains the configuration information for the specified ADC

Returns

Floating-point light intensity value

3.3 ldr.h

Go to the documentation of this file.
```
00001
00010 #ifndef LDR_H
00011 #define LDR_H
00012
00013 #include "stm32f0xx_hal.h"
00014
00018 void LDR_Init(void);
00019
00025 uint32_t LDR_ReadADC(ADC_HandleTypeDef *hadc);
00026
00032 float LDR_ReadAnalogLightIntensity(ADC_HandleTypeDef *hadc);
00033
00034 #endif // LDR_H
```

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