LTR303ALS DIGITAL LIGHT SENSOR

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Chapter 1

LTR-303ALS Ambient Light Sensor Integration Guide

This guide will help you integrate the `ltr303als.h` and `ltr303als.c` files into your STM32 project using the LTR-303ALS Ambient Light Sensor.

1.1 Step 1: Download the library files

Download the following files:

- `ltr303als.h`
- `ltr303als.c`

1.2 Step 2: Add the library files to your project

1. Open your STM32 project in the STM32CubeIDE or your preferred IDE.
2. Copy the `ltr303als.h` file into the `Inc` folder of your project.
3. Copy the `ltr303als.c` file into the `Src` folder of your project.

1.3 Step 3: Include the library in your code

In the source file where you want to use the LTR-303ALS library (usually `main.c`), add the following line at the beginning of the file:

```
#include "ltr303als.h"
```

1.4 Step 4: Initialize the sensor

Initialize the LTR-303ALS sensor by calling the `LTR303ALS_Init` function, passing a pointer to an `I2C_↩HandleTypeDef` structure and the desired integration time and measurement rate.

```
I2C_HandleTypeDef hi2c1; // This should be configured and initialized using HAL

if (LTR303ALS_Init(&hi2c1, INTEGRATION_TIME, MEASUREMENT_RATE) != HAL_OK) {
    // Handle initialization error
}
```

1.5 Step 5: Read light intensity

To read the light intensity from the sensor, call the `LTR303ALS_ReadLightIntensity` function, passing a pointer to an `I2C_HandleTypeDef` structure and pointers to two `uint16_t` variables that will store the values of channels 0 and 1.

```
uint16_t ch0, ch1;

if (LTR303ALS_ReadLightIntensity(&hi2c1, &ch0, &ch1) != HAL_OK) {
    // Handle read error
} else {
    // Process light intensity data
}
```

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 ltr303als.c File Reference

LTR-303ALS Ambient Light Sensor Library Implementation.

```
#include "ltr303als.h"
```

Functions

- HAL_StatusTypeDef LTR303ALS_Init (I2C_HandleTypeDef *hi2c, uint8_t integration_time, uint8_t measurement_rate)

  Initialize the LTR-303ALS Ambient Light Sensor.
- HAL_StatusTypeDef LTR303ALS_ReadLightIntensity (I2C_HandleTypeDef *hi2c, uint16_t *ch0, uint16_t *ch1)

  Read light intensity from the LTR-303ALS Ambient Light Sensor.

3.1.1 Detailed Description

LTR-303ALS Ambient Light Sensor Library Implementation.

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Date

6th of May 2023

3.1.2 Function Documentation

3.1.2.1 LTR303ALS_Init()

```
HAL_StatusTypeDef LTR303ALS_Init (
            I2C_HandleTypeDef * hi2c,
            uint8_t integration_time,
            uint8_t measurement_rate )
```

Initialize the LTR-303ALS Ambient Light Sensor.

Initialize the LTR-303ALS sensor.

Parameters

hi2c	Pointer to an I2C_HandleTypeDef structure that contains the configuration information for the specified I2C
integration_time	Integration time for the LTR-303ALS
measurement_rate	Measurement rate for the LTR-303ALS

Returns

HAL status (HAL_OK if successful, HAL_ERROR otherwise)

3.1.2.2 LTR303ALS_ReadLightIntensity()

```
HAL_StatusTypeDef LTR303ALS_ReadLightIntensity (
            I2C_HandleTypeDef * hi2c,
            uint16_t * ch0,
            uint16_t * ch1 )
```

Read light intensity from the LTR-303ALS Ambient Light Sensor.

Read light intensity data from the LTR-303ALS sensor.

Parameters

hi2c	Pointer to an I2C_HandleTypeDef structure that contains the configuration information for the specified I2C
ch0	Pointer to a uint16_t variable to store the Channel 0 data
ch1	Pointer to a uint16_t variable to store the Channel 1 data

Returns

HAL status (HAL_OK if successful, HAL_ERROR otherwise)

3.2 ltr303als.h File Reference

LTR-303ALS Ambient Light Sensor Library Header.

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

Macros

- #define **LTR303ALS_I2C_ADDRESS** 0x29

Functions

- HAL_StatusTypeDef LTR303ALS_Init (I2C_HandleTypeDef *hi2c, uint8_t integration_time, uint8_t measurement_rate)

  Initialize the LTR-303ALS sensor.
- HAL_StatusTypeDef LTR303ALS_ReadLightIntensity (I2C_HandleTypeDef *hi2c, uint16_t *ch0, uint16_t *ch1)

  Read light intensity data from the LTR-303ALS sensor.

3.2.1 Detailed Description

LTR-303ALS Ambient Light Sensor Library Header.

Author

Travimadox Webb @position Embedded Software Engineer @company Imperium LLC

Date

7th of May 2023

3.2.2 Function Documentation

3.2.2.1 LTR303ALS_Init()

```
HAL_StatusTypeDef LTR303ALS_Init (
            I2C_HandleTypeDef * hi2c,
            uint8_t integration_time,
            uint8_t measurement_rate )
```

Initialize the LTR-303ALS sensor.

Parameters

hi2c	Pointer to the I2C handle.
integration_time	Integration time (in ms) for the sensor.
measurement_rate	Measurement rate (in ms) for the sensor.

Returns

HAL status.

Initialize the LTR-303ALS sensor.

Parameters

hi2c	Pointer to an I2C_HandleTypeDef structure that contains the configuration information for the specified I2C
integration_time	Integration time for the LTR-303ALS
measurement_rate	Measurement rate for the LTR-303ALS

Returns

HAL status (HAL_OK if successful, HAL_ERROR otherwise)

3.2.2.2 LTR303ALS_ReadLightIntensity()

```
HAL_StatusTypeDef LTR303ALS_ReadLightIntensity (
            I2C_HandleTypeDef * hi2c,
            uint16_t * ch0,
            uint16_t * ch1 )
```

Read light intensity data from the LTR-303ALS sensor.

Parameters

hi2c	Pointer to the I2C handle.
ch0	Pointer to store the channel 0 data.
ch1	Pointer to store the channel 1 data.

Returns

HAL status.

Read light intensity data from the LTR-303ALS sensor.

Parameters

hi2c	Pointer to an I2C_HandleTypeDef structure that contains the configuration information for the specified I2C
ch0	Pointer to a uint16_t variable to store the Channel 0 data
ch1	Pointer to a uint16_t variable to store the Channel 1 data

Returns

HAL status (HAL_OK if successful, HAL_ERROR otherwise)

3.3 ltr303als.h

Go to the documentation of this file.

```
00001
00010 #ifndef LTR303ALS_H
00011 #define LTR303ALS_H
00012
00013 #include "stm32f0xx_hal.h"
00014
00015 // LTR-303ALS I2C address (default: 0x29)
00016 #define LTR303ALS_I2C_ADDRESS 0x29
00017
00025 HAL_StatusTypeDef LTR303ALS_Init(I2C_HandleTypeDef *hi2c, uint8_t integration_time, uint8_t
      measurement_rate);
00026
00034 HAL_StatusTypeDef LTR303ALS_ReadLightIntensity(I2C_HandleTypeDef *hi2c, uint16_t *ch0, uint16_t *ch1);
00035
00036 #endif // LTR303ALS_H
```

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