

## IoT RGB Strip

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## Chapter 1

# README

Device IoT, which allows you to control the color and brightness of the RGB Strip. Using the application for a smartphone you can easily manage all the functionality of the device.



## Chapter 2

# File Index

### 2.1 File List

Here is a list of all files with brief descriptions:

<a href="#">configuration_bits.c</a>	5
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# Chapter 3

## File Documentation

### 3.1 configuration\_bits.c File Reference

### 3.2 main.c File Reference

```
#include <stdint.h>
#include <stdbool.h>
#include "user.h"
```

#### Functions

- `int32_t main (void)`  
*Initialize I/O and Peripherals for application Setup functionality and port direction.*

#### 3.2.1 Function Documentation

##### 3.2.1.1 main()

```
int32_t main (
    void )
```

Initialize I/O and Peripherals for application Setup functionality and port direction.

#### Parameters

out	<i>none</i>	
in	<i>none</i>	

**Returns**

none

### 3.3 README.md File Reference

### 3.4 UART.c File Reference

```
#include "UART.h"
```

**Functions**

- void [uart4\\_init](#) (void)
- char [uart4\\_getc](#) (void)
- void [uart4\\_putc](#) (char c)
- void [uart4\\_puts](#) (char \*s)
- void [uart4\\_test](#) (void)

#### 3.4.1 Function Documentation

##### 3.4.1.1 [uart4\\_getc\(\)](#)

```
char uart4\_getc (  
    void )
```

**Function prototype:**

```
void uart4\_getc(void);
```

**Description:**

read char symbol from UART

**Parameters:**

none

**Returns:**

none

#### 3.4.1.2 uart4\_init()

```
void uart4_init (
    void )
```

**Function prototype:**

```
void uart4\_init(void);
```

**Description:**

initialize UART

**Parameters:**

none

**Returns:**

none

#### 3.4.1.3 uart4\_putc()

```
void uart4_putc (
    char c )
```

**Function prototype:**

```
void uart4\_putc(char c);
```

**Description:**

put char symbol to UART

**Parameters:**

char symbol 'c'

**Returns:**

none

#### 3.4.1.4 uart4\_puts()

```
void uart4_puts (
    char * s )
```

**Function prototype:**

```
void uart4\_puts(char *s);
```

**Description:**

put char array to UART

**Parameters:**

char array 's'

**Returns:**

none

#### 3.4.1.5 uart4\_test()

```
void uart4_test (
    void )
```

**Function prototype:**

```
void uart4\_test(void);
```

**Description:**

UART test and beginning program

**Parameters:**

none

**Returns:**

none

## 3.5 UART.h File Reference

```
#include <xc.h>
```

### Functions

- void [uart4\\_init](#) (void)
- char [uart4\\_getc](#) (void)
- void [uart4\\_putc](#) (char c)
- void [uart4\\_puts](#) (char \*s)
- void [uart4\\_test](#) (void)

#### 3.5.1 Function Documentation

##### 3.5.1.1 uart4\_getc()

```
char uart4_getc (
    void )
```

**Function prototype:**

```
void uart4\_getc(void);
```

**Description:**

read char symbol from UART

**Parameters:**

none

**Returns:**

none

### 3.5.1.2 uart4\_init()

```
void uart4_init (
    void )
```

**Function prototype:**

```
void uart4\_init(void);
```

**Description:**

initialize UART

**Parameters:**

none

**Returns:**

none

### 3.5.1.3 uart4\_putc()

```
void uart4_putc (
    char c )
```

**Function prototype:**

```
void uart4\_putc(char c);
```

**Description:**

put char symbol to UART

**Parameters:**

char symbol 'c'

**Returns:**

none

### 3.5.1.4 uart4\_puts()

```
void uart4_puts (
    char * s )
```

**Function prototype:**

```
void uart4\_puts(char *s);
```

**Description:**

put char array to UART

**Parameters:**

char array 's'

**Returns:**

none

### 3.5.1.5 uart4\_test()

```
void uart4_test (
    void )
```

#### Function prototype:

```
void uart4\_test(void);
```

#### Description:

UART test and beginning program

#### Parameters:

none

#### Returns:

none

## 3.6 user.c File Reference

```
#include <stdint.h>
#include <stdbool.h>
#include <string.h>
#include "user.h"
#include <sys/attrs.h>
#include "UART.h"
```

### Functions

- void [init\\_gpio](#) (void)  
*Initialize input output Setup functionality and port direction.*
- void [InitTimer2AndOC5And4And8](#) (void)  
*Initialize Timer2 Initialize Timer2. Configure OC4,OC5,OC8 control register. Configure PWM for RGB.*
- void [init\\_app](#) (void)
- void [rgb](#) (int red, int green, int blue)
- void [start\\_program](#) ()  
*all functional of programm*
- void [fade](#) ()
- void [delay](#) (uint32\_t n)
- void [brightness](#) (int bright)

### 3.6.1 Function Documentation

#### 3.6.1.1 brightness()

```
void brightness (
    int bright )
```

func delay

**Parameters**

out	<i>none</i>	
in	<i>brigh(PWM)</i>	

**Returns**

none

**3.6.1.2 delay()**

```
void delay (
           uint32_t n )
```

func delay

**Parameters**

out	<i>none</i>	
in	<i>n</i>	- time in mills

**Returns**

none

**3.6.1.3 fade()**

```
void fade ( )
```

fade mode

**Parameters**

out	<i>none</i>	
in	<i>none</i>	

**Returns**

none

#### 3.6.1.4 init\_app()

```
void init_app (
    void )
```

begins program

##### Parameters

out	<i>none</i>	
in	<i>none</i>	

##### Returns

none

#### 3.6.1.5 init\_gpio()

```
void init_gpio (
    void )
```

Initialize input output Setup functionality and port direction.

##### Parameters

out	<i>none</i>	
in	<i>none</i>	

##### Returns

none

#### 3.6.1.6 InitTimer2AndOC5And4And8()

```
void InitTimer2AndOC5And4And8 (
    void )
```

Initialize Timer2 Initialize Timer2. Configure OC4,OC5,OC8 control register. Configure PWM for RGB.

##### Parameters

out	<i>none</i>	
in	<i>none</i>	



**Returns**

none

**3.6.1.7 rgb()**

```
void rgb (
    int red,
    int green,
    int blue )
```

func for control rgb led(set color)

**Parameters**

out	<i>none</i>	
in	<i>red,green,blue</i>	(PwM)

**Returns**

none

**3.6.1.8 start\_program()**

```
void start_program ( )
```

all functional of programm

Functional: command a - turn on RGB led. command f - fade mode command c - set color command b - set brightness

**Parameters**

out	<i>none</i>	
in	<i>none</i>	

**Returns**

none

**3.7 user.h File Reference**

```
#include <stdint.h>
```

## Macros

- `#define LD1_PORT_BIT LATGbits.LATG6`
- `#define LD2_PORT_BIT LATDbits.LATD4`
- `#define LD3_PORT_BIT LATBbits.LATB11`
- `#define LD4_PORT_BIT LATGbits.LATG15`
- `#define BTN1_PORT_BIT PORTAbits.RA5`
- `#define BTN2_PORT_BIT PORTAbits.RA4`
- `#define PWM_FREQ_HZ (1000)`
- `#define PWM_PERIOD_COUNTS (100000000/(256*PWM_FREQ_HZ))`
- `#define MAX_ADC_VALUE (4095)`

## Functions

- void `init_app` (void)

### 3.7.1 Macro Definition Documentation

#### 3.7.1.1 BTN1\_PORT\_BIT

```
#define BTN1_PORT_BIT PORTAbits.RA5
```

#### 3.7.1.2 BTN2\_PORT\_BIT

```
#define BTN2_PORT_BIT PORTAbits.RA4
```

#### 3.7.1.3 LD1\_PORT\_BIT

```
#define LD1_PORT_BIT LATGbits.LATG6
```

#### 3.7.1.4 LD2\_PORT\_BIT

```
#define LD2_PORT_BIT LATDbits.LATD4
```

### 3.7.1.5 LD3\_PORT\_BIT

```
#define LD3_PORT_BIT LATBbits.LATB11
```

### 3.7.1.6 LD4\_PORT\_BIT

```
#define LD4_PORT_BIT LATGbits.LATG15
```

### 3.7.1.7 MAX\_ADC\_VALUE

```
#define MAX_ADC_VALUE (4095)
```

### 3.7.1.8 PWM\_FREQ\_HZ

```
#define PWM_FREQ_HZ (1000)
```

### 3.7.1.9 PWM\_PERIOD\_COUNTS

```
#define PWM_PERIOD_COUNTS (100000000/(256*PWM_FREQ_HZ))
```

## 3.7.2 Function Documentation

### 3.7.2.1 init\_app()

```
void init_app (  
    void )
```

begins program

#### Parameters

out	<i>none</i>	
in	<i>none</i>	

**Returns**

none

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