

EV3 C LCD API REFERENCE AND SAMPLE

tari (s1250039)

THE UNIVERSITY OF AIZU ROBOT TEAM REMs

maipenrai@u-aizu.ac.jp

PREFACE

Since the day I lost her dazzling smile like a sunflower, I had been searching for the meaning of what I live for.

That is still missing or already found, but I don't know which is true.

She reminded me that I am not alone, and her smile gave me many meaningful things.

Two weeks have passed from that day.

I am still alive and my heart is still working.

And I got a very important mission.

The first mission is to get a place in the ET Robot Contest.

I must grow and reap the harvest what she aspired and she couldn't grow.

I will begin this presentation with keeping her dazzling smile in my mind.

SAMPLE CODE FORMAT

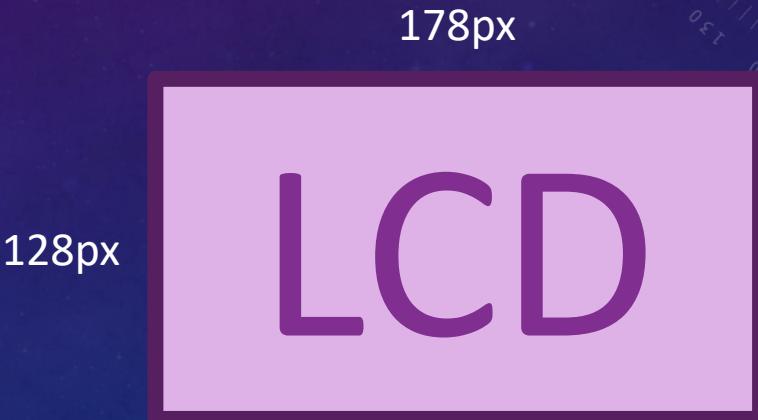
```
void main_task(intptr_t unused)
{
    create_system();
    initialize();
    [PUT SAMPLE CODE HERE]
    while (1);
    delete_system();
    ext_tsk();
}
```

CONTENTS - 18PAGES (FROM FIRST SLIDE)

- 1. ABOUT EV3 LCD**
- 2. DATA STRUCTURE**
- 3. DEFINITION**
- 4. ENUM**
- 5. FUNCTION**

1. ABOUT EV3 LCD

- EV3 has a white-and-black monochrome display.
- The resolution is 178px × 128px. (W × H)
- You can use LCD for:
 - 1. drawing string
 - 2. drawing shape
 - 3. displaying image



2. DATA STRUCTURE

LCD API provides a data structure for containing bitmap image.

```
typedef struct{
    int32_t width;
    int32_t height;
    void*   data;
}
```

3. DEFINITION

The width and height of LCD are defined by macro definition.

```
#define EV3_LCD_WIDTH 178  
  
#define EV3_LCD_HEIGHT 128
```

4. ENUM

Font size and drawing color are defined by enum.

Font size (For drawing String)

```
enum Lcdfont_t {  
    EV3_FONT_SMALL,  
    EV3_FONT_MEDIUM  
}
```

Color (For drawing Rectangle)

```
enum Lcdcolor_t {  
    EV3_LCD_WHITE = 0,  
    EV3_LCD_BLACK = 1  
}
```

5. FUNCTIONS

- 8 functions are provided for using LCD.
- For drawing string:
 - `ev3_lcd_set_font`
 - `ev3_font_get_size`
 - `ev3_lcd_draw_string`
- For drawing shape:
 - `ev3_lcd_draw_line`
 - `ev3_lcd_draw_rect`
- For displaying image:
 - `ev3_image_load`
 - `ev3_lcd_draw_image`
 - `ev3_image_free`

5-1. FUNCTIONS FOR DRAWING STRING

- ev3_lcd_set_font
- ev3_font_get_size
- ev3_lcd_draw_string

ev3_lcd_set_font

Using this function, you can set the default font.

```
ev3_lcd_set_font([Type of font]);
```

There are two types of font defined by enum:

- **EV3_FONT_SMALL** : Small font
- **EV3_FONT_MEDIUM** : Normal font

ev3_font_get_size

- Using this function, you can get font size.
- We don't use this function at ET projekt.

ev3_lcd_draw_string

Using this function, you can draw the string you want to display.

```
ev3_lcd_draw_string([String], [X position], [Y position]);
```

- Put the string you want to display on the first argument.
- X and Y positions are the coordinates of upper-left corner on the string you want to display.

DRAWING STRING SAMPLE

```
ev3_lcd_set_font(EV3_FONT_MEDIUM);  
ev3_lcd_draw_string("Hello Shinchoku", 0, 0);
```

5-2. FUNCTIONS FOR DRAWING SHAPE

- ev3_lcd_draw_line
- ev3_lcd_fill_rect

ev3_lcd_draw_line

Using this function, you can draw a line on the LCD.

```
ev3_lcd_draw_line([X of position1], [Y of position1], [X of position2], [Y of position2]);
```

- Position1 is the start position of the line.
- Position2 is the end position of the line.

ev3_lcd_fill_rect

Using this function, you can draw a rectangle filled with white or black color on the LCD.

```
ev3_lcd_draw_line([X of position1], [Y of position1], [X of position2], [Y of position2], [Color]);
```

- It is like `ev3_lcd_draw_line`.
- `[Color]` defined by enum:
 - `EV3_LCD_WHITE` : White
 - `EV3_LCD_BLACK` : Black

DRAWING SHAPE SAMPLE

```
ev3_lcd_draw_line(0, 0, 10, 10);  
ev3_lcd_fill_rect(10, 10, 20, 20, EV3_LCD_BLACK);
```

5-3. FUNCTIONS FOR DISPLAY IMAGE

- ev3_image_load
- ev3_lcd_draw_image
- ev3_image_free

ev3_image_load

- これ使わないやろ.....

ev3_lcd_draw_image

- これも使わない

ev3_image_free

- これも使わない

DISPLAYING IMAGE SAMPLE

```
ev3_lcd_draw_line(0, 0, 10, 10);  
ev3_lcd_fill_rect(10, 10, 20, 20, EV3_LCD_BLACK);
```

DISPLAY IMAGE SAMPLE

```
ev3_lcd_draw_string("Hello Shinchoku", 0, 0);
```