

Wireless Sensor Networks

PRACTICAL TRAINING 1 EXTRA

Introduction

If you finished part 1 of the training early you can combine your newly acquired skills in a small final project for this part.

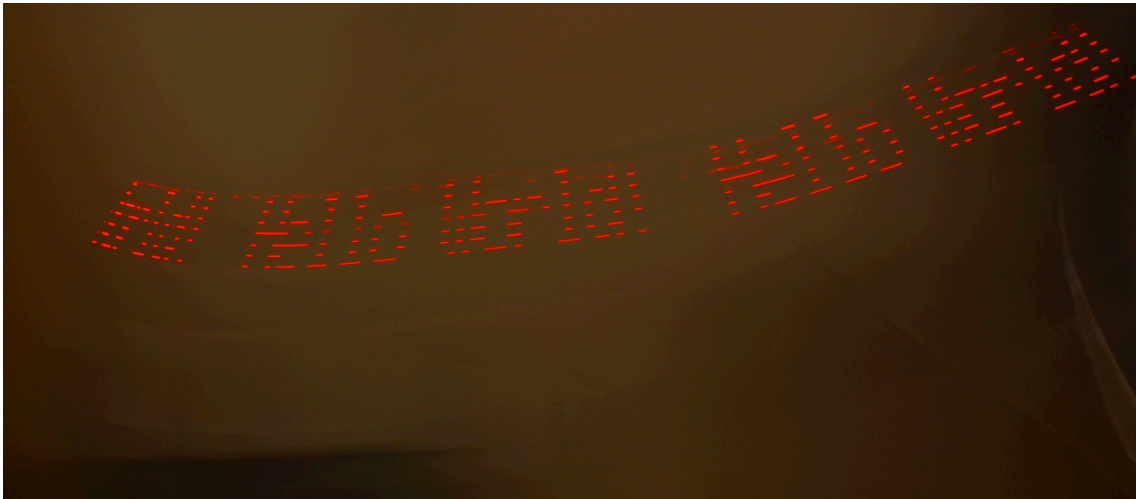


Figure 1. – Hello World! Light array

POI light toy

We try to set up a small lightshow with the Spi port expander, which reads data from the Flash memory and the Uart interface.

The goal of this task is to build a POI (point of interest) light toy.

Therefore we will use our measure interface and its 8 leds for generating the light patterns as in Figure 1. The text in the figure can only be observed on a picture taken with a camera. The camera as set up to have a longer exposure time in the range of 500ms. When we now shake our device, while outputting the hello world string, we can see the characters.

<https://youtu.be/YuVXndVujG8?t=1m5s>

1. For this project we will first try to send a data array out and capture it with a long exposure photography. Your code should just be a for loop with the `send_Byte()` function. As data you should use an array and the index of the for loop

0	1	1	1	0
1	0	0	0	1
1	0	0	0	1
1	0	0	0	1
1	1	1	1	1
1	0	0	0	1
1	0	0	0	1
1	0	0	0	1
1	2	3	4	5
7F	88	88	88	7F

2. A Char array library will be provided for you.

The font.c file includes a char variable with the name font. Every line of the font char array corresponds to a letter. The characters consist of an 5x8 array. The 5 hex values per line are the columns of the array.

To get the first line column of the letter A we only need to use the font array.

```
font['A'*5 + 0]
```

For the last column we use this code.

```
font['A'*5 + 4]
```

Figure 2. – char array

3. Now you can write a function which takes a imputed char and displays it with the leds
 - At this point you can test your project again with a camera and long exposure time
4. The next task is to read some text from the Uart interface and save the data in flash memory. After you reset the microcontroller it should start up und display the content of the flash memory