

ICLED WEBINAR: PRECISE COLOR CORRECTION WITH THE IC CALCULATOR

Carlos Hernandez & Adrian Stirn | External | 17.06.2025

EXTERNAL

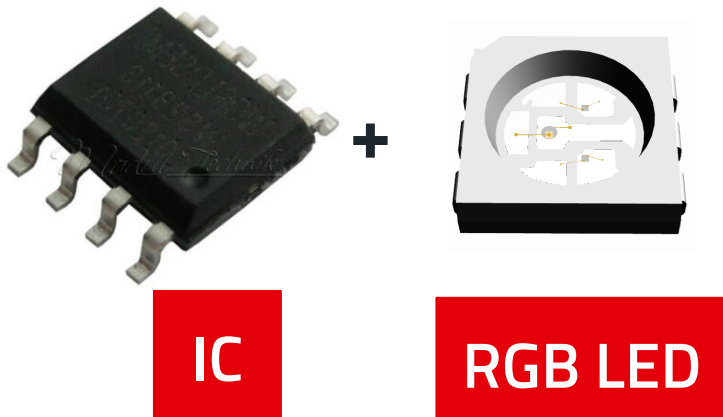
WÜRTH ELEKTRONIK MORE THAN YOU EXPECT

INTRODUCTION

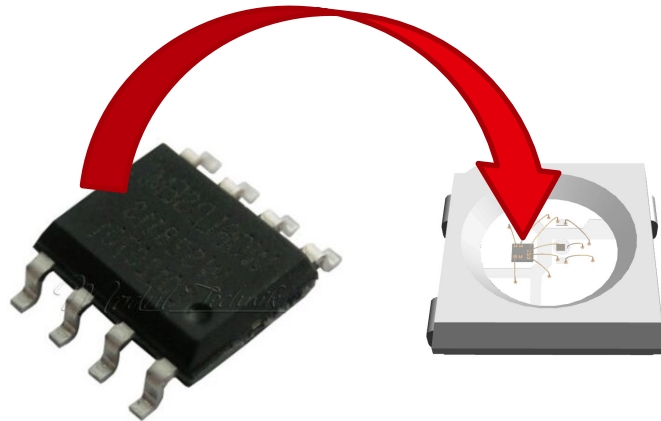
IC LEDs

What are ICLEDs?

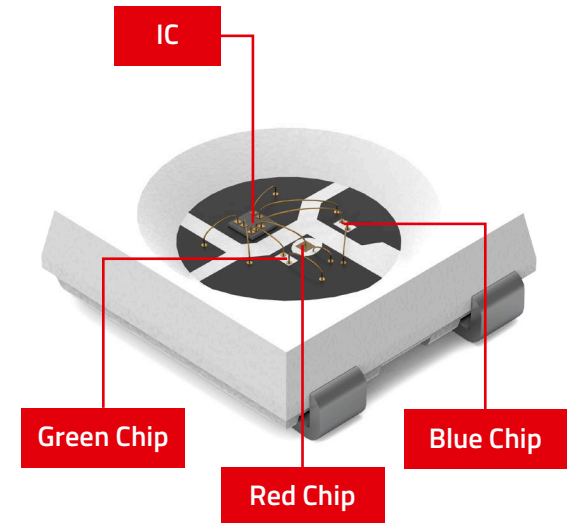
Before



Solution



Now



Intelligent LED

Neopixel

DotStar

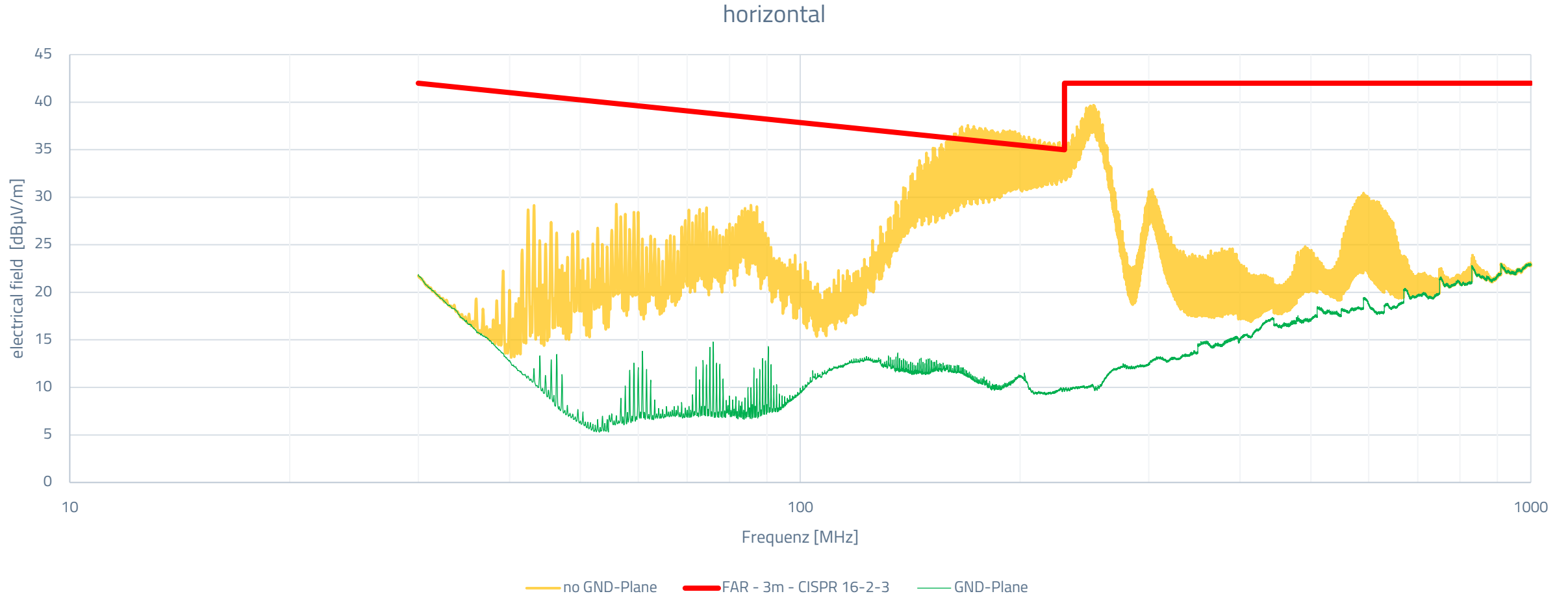
Addressable LED

Smart LED

Digital LED

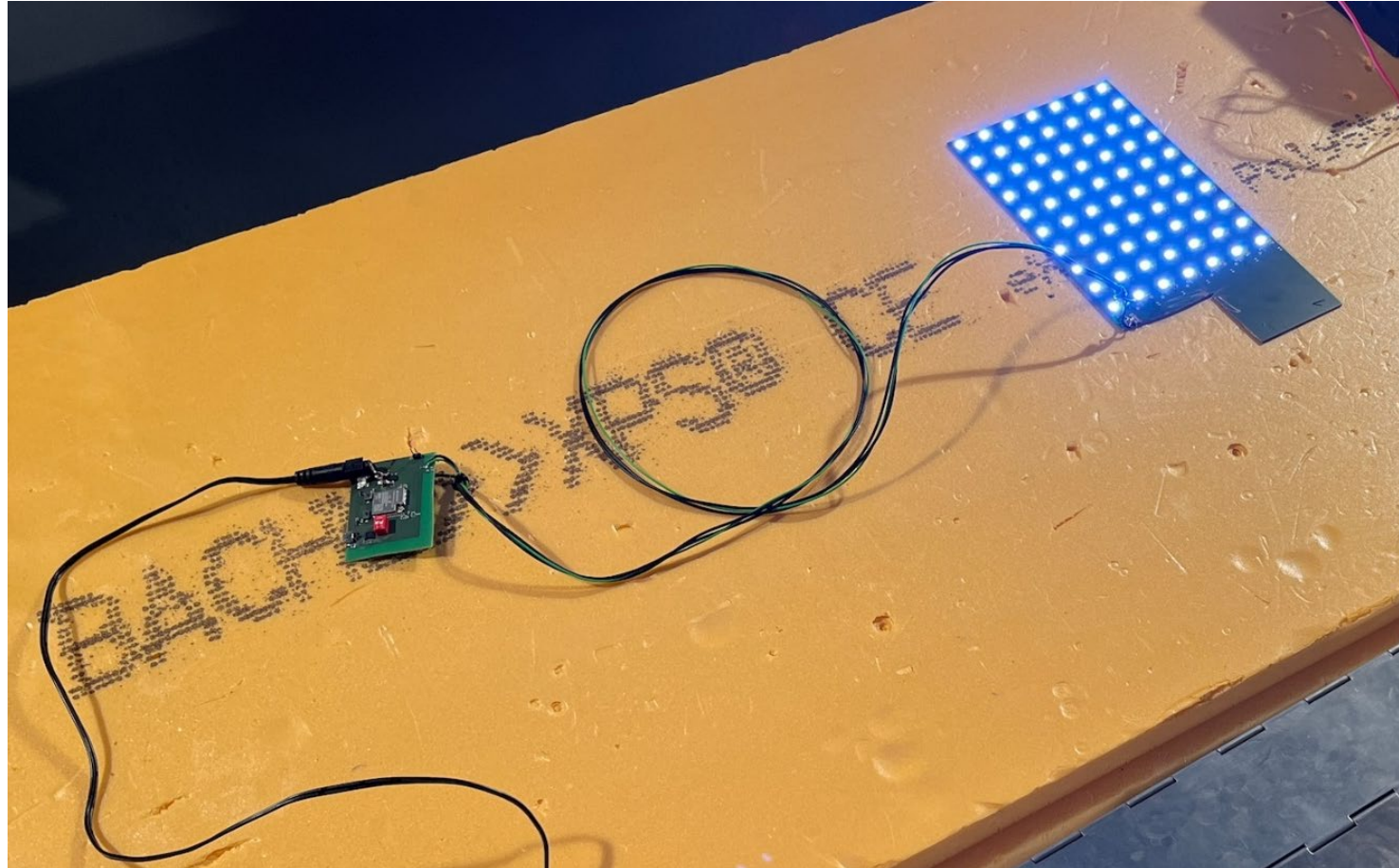
MCU AND IC LED ON THE SAME PCB

Influence of a GND plane on the EMI performance



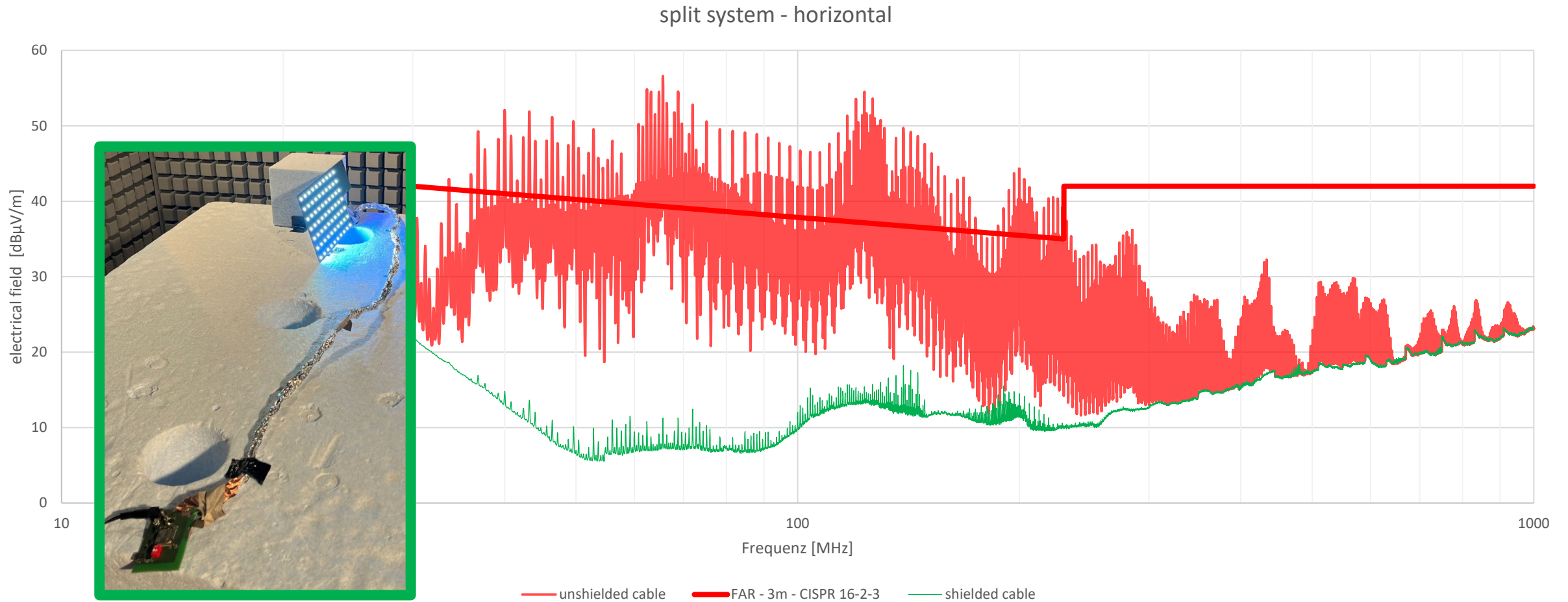
MCU AND IC-LEDS ON DIFFERENT PCBS

Both PCBs with GND-plane!



MCU AND IC-LEDS ON DIFFERENT PCBS

Both PCBs with GND-plane!



WÜRTH ELEKTRONIK ICLEDS

More information

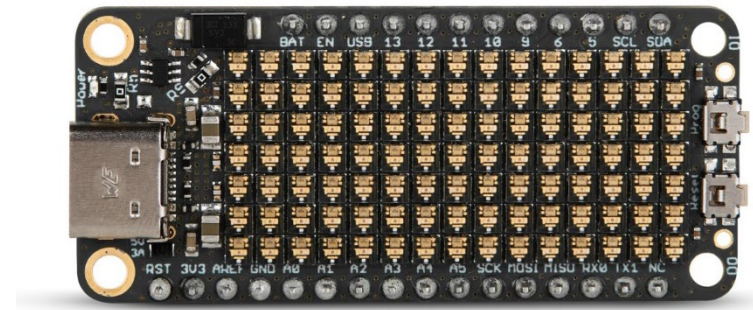
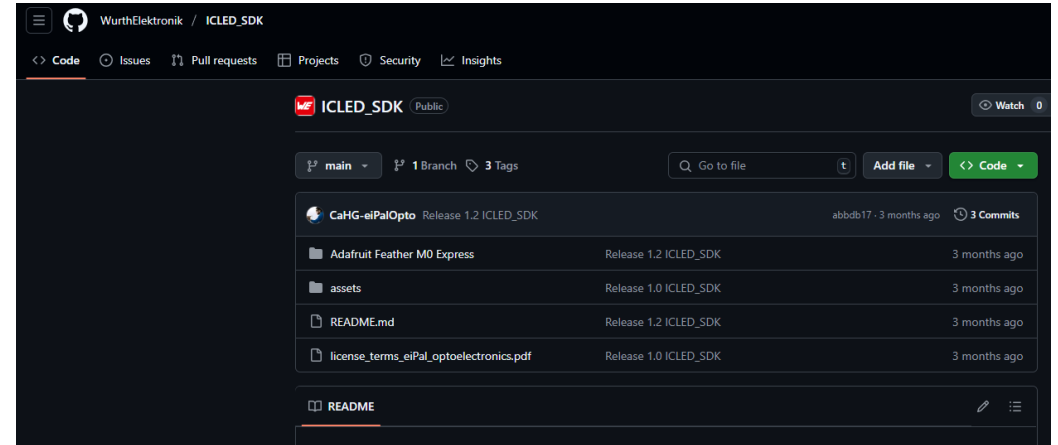
- Programming libraries from WE:
- Evaluation Board:
- Programming libraries for Featherwing:
- Color Mixing Tool:

[Github](#)

[ICLED Featherwing](#)

[Github FeatherWing](#)

[ICLED Color Calculator](#)



ICLED COLOR CALCULATOR

Overview

ICLED (Matrix) number

R

G

B

Digital dimming

```
case TEST2:
  ICLED_set_Matrix(0, 255, 162, 161, 32,true); // Bin 16
  ICLED_set_Matrix(1, 255, 131, 125, 32,true); // Bin 33
  ICLED_set_Matrix(2, 255, 171, 163, 32,true); // Bin 34
  delay(1000);
break;
```

Example code to control ICLEDs

With this innovative tool you can determine the PWM values needed to get the exact color of your IC LED batch. You can also predict the colors and performance of your setting, based on the CIE 1931 color space coordinates and obtain reliable and practical results with just a few clicks.

PWM Estimation **Color Estimation** [Estimation log](#) [Save estimation](#)

Select your product [i](#)

Select ICLED: 1315050930002

Lot N°: 016

ICLED Target Performance [i](#)

x Coordinate: 0,3 y Coordinate: 0,3

Luminance: Iv (mcd) 1735

Result

To obtain the defined colour, the following PWM values must be sent.

	Dec	Hex
R	255	FF
G	162	A2
B	161	A1

CIE 1931 Color Space

[i](#) x,y target [Color Gamut LED](#)

ICLED COLOR CALCULATOR

Calculation of the PWM signals according to a target color

The screenshot shows the 'RED EXPERT' IC LED color mixer interface. At the top, there are logos for 'WÜRTH ELEKTRONIK' and 'RED EXPERT IC LED color mixer', along with navigation icons and a 'Menu' button. The main content area includes a descriptive paragraph, two tabs ('PWM Estimation' and 'Color Estimation'), and buttons for 'Estimation log' and 'Save estimation'. Below this, there are three sections: 'Select your product' with input fields for 'Select ICLED *' and 'Lot N°'; 'ICLED Target Performance' with 'x Coordinate' and 'y Coordinate' buttons, an 'Iv (mcd)' input field, and a brightness slider; and 'Result' which contains a table of PWM values and a 'CIE 1931 Color Space' diagram. The table shows Dec and Hex values for R, G, and B channels, all currently set to dashes. The CIE diagram shows a color gamut with a target point marked.

With this innovative tool you can determine the PWM values needed to get the exact color of your IC LED batch. You can also predict the colors and performance of your setting, based on the CIE 1931 color space coordinates and obtain reliable and practical results with just a few clicks.

PWM Estimation | Color Estimation | Estimation log | Save estimation

Select your product ⓘ

Select ICLED *
Lot N°

ICLED Target Performance ⓘ

x Coordinate | y Coordinate

Iv (mcd)

☀️ ————— ☀️

Result

To obtain the defined colour, the following PWM values must be sent.

	Dec	Hex
R	-	-
G	-	-
B	-	-

CIE 1931 Color Space

• x,y target | Color Gamut LED

ICLED COLOR CALCULATOR

Color estimation according to the PWM signal

The screenshot shows the 'ICLED color mixer' web application. At the top, there is a navigation bar with the 'WÜRTH ELEKTRONIK' logo on the left, 'REDEXPERT IC LED color mixer' in the center, and a 'Menu' button on the right. Below the navigation bar, a text box explains the tool's purpose: 'With this innovative tool you can determine the PWM values needed to get the exact color of your IC LED batch. You can also predict the colors and performance of your setting, based on the CIE 1931 color space coordinates and obtain reliable and practical results with just a few clicks.'

The main interface is divided into several sections:

- Navigation:** Two tabs are visible: 'PWM Estimation' (highlighted) and 'Color Estimation'.
- Actions:** 'Estimation log' and 'Save estimation' buttons are located in the top right of the main content area.
- Select your product:** Includes a dropdown for 'Select ICLED *' and a text input for 'Lot N°'.
- ICLED Target Performance:** Features input fields for 'x Coordinate' and 'y Coordinate', a 'Iv (mcd)' input field, and a brightness slider.
- Result:** A section titled 'To obtain the defined colour, the following PWM values must be sent.' containing a table with columns 'Dec' and 'Hex' and rows for 'R', 'G', and 'B'. All values are currently dashes.
- CIE 1931 Color Space:** A 2D color space diagram with axes 'x' and 'y' ranging from 0 to 0.8. It shows a color gamut (rainbow) and a target point (x,y target) marked with a dot.