CEC Continuing Education Center

DesignNews

IoT Designs Using STmicro Microcontrollers

Day 3:

Exploring TouchGFX

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Webinar Logistics

- Turn on your system sound to hear the streaming presentation.
- If you have technical problems, click “Help” or submit a question asking for assistance.
- Participate in ‘Attendee Chat’ by maximizing the chat widget in your dock.

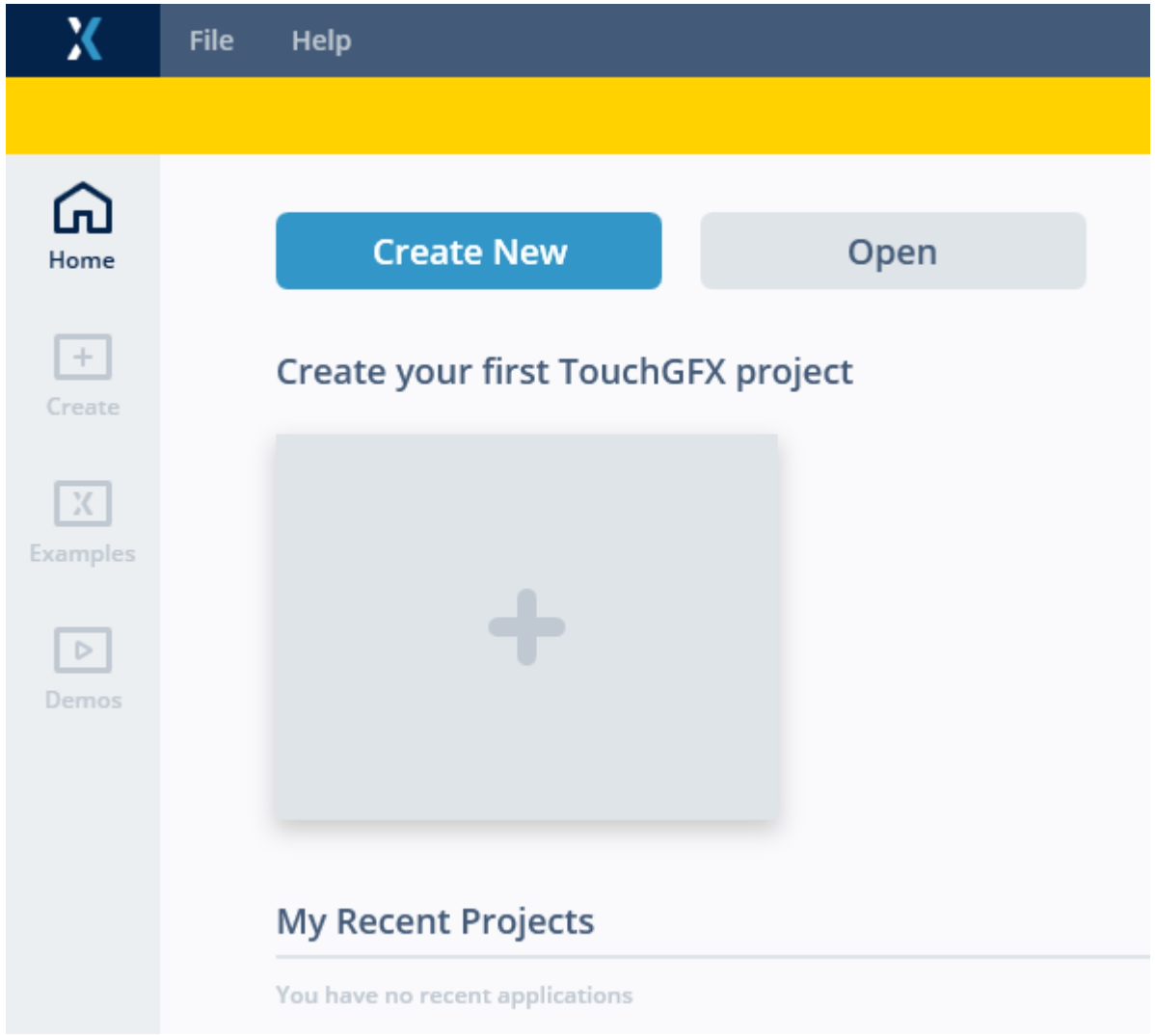
Fred Eady

Visit ‘Lecturer Profile’ in your console for more details.

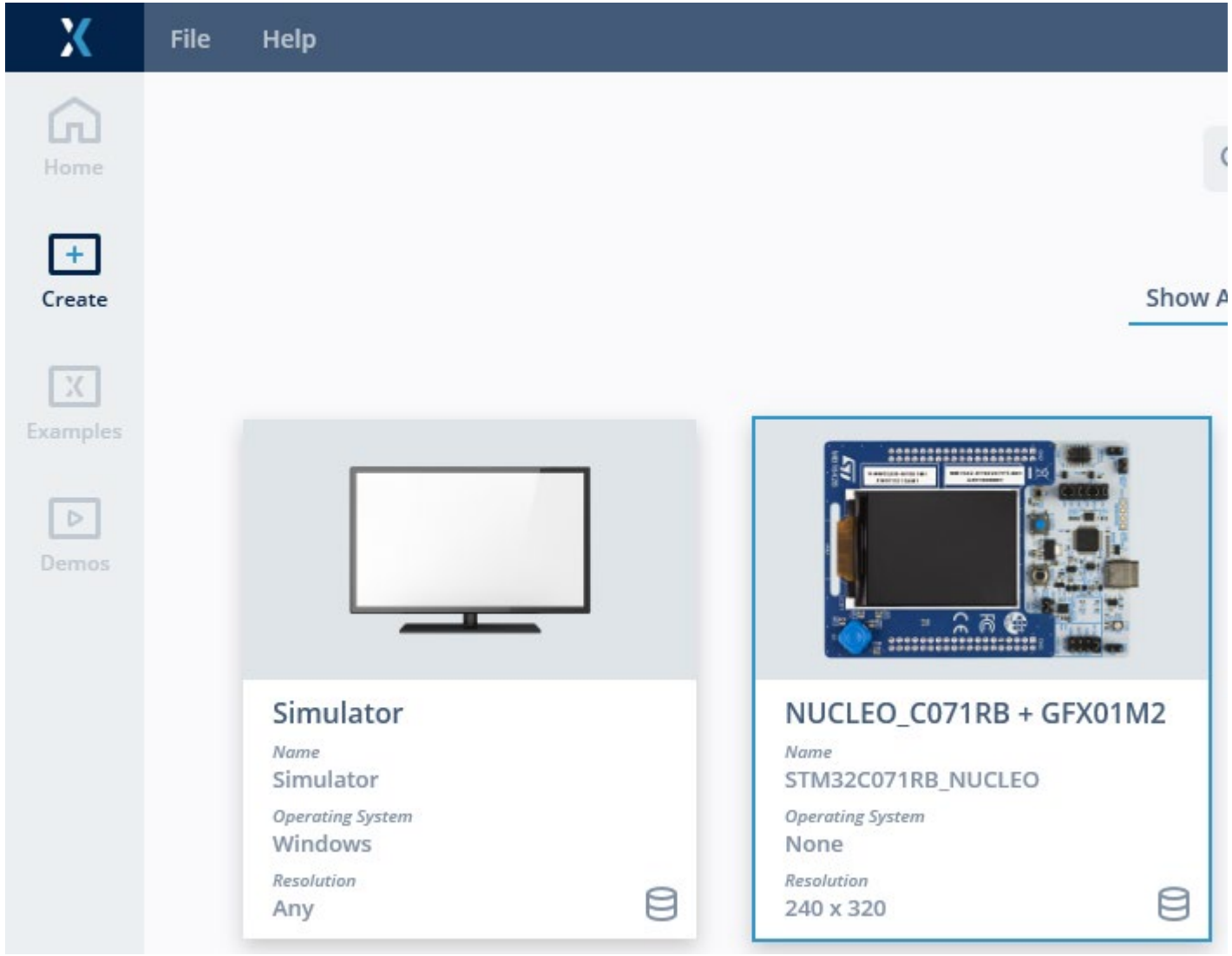
AGENDA

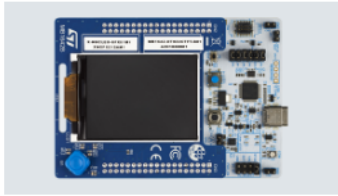
- Build an X-NUCLEO-GFX01M2 TouchGFX Application
  - Create a New NUCLEO-C071RB TouchGFX Project
  - Layout the Screen
  - Define the Interactions
  - Customize the NUCLEO-C071RB TouchGFX Project
  - Program and Run the TouchGFX Project
- Build an STM32U5G9J-DK2 TouchGFX Application
  - The Song Remains the Same

Create a New NUCLEO-C071RB TouchGFX Project



Create a New NUCLEO-C071RB TouchGFX Project





NUCLEO_C071RB + GFX01M2

STMicroelectronics

Operating system: None

Description

This TouchGFX Board Setup is for the NUCLEO-C071RB board with X-NUCLEO-GFX01M2 (version AZ1 and AZ2) mounted on top.

Chip/board specifications:
- 48 MHz CPU
- 24 kB internal SRAM
- 128 kB internal flash
- 8 MB external flash (mounted on X-NUCLEO-GFX01M2)
- 24 MHz SPI display interface

Framebuffer setup:
- Partial framebuffer

Application Name

CEC_Day3

Application Directory

C:\TouchGFXProjects

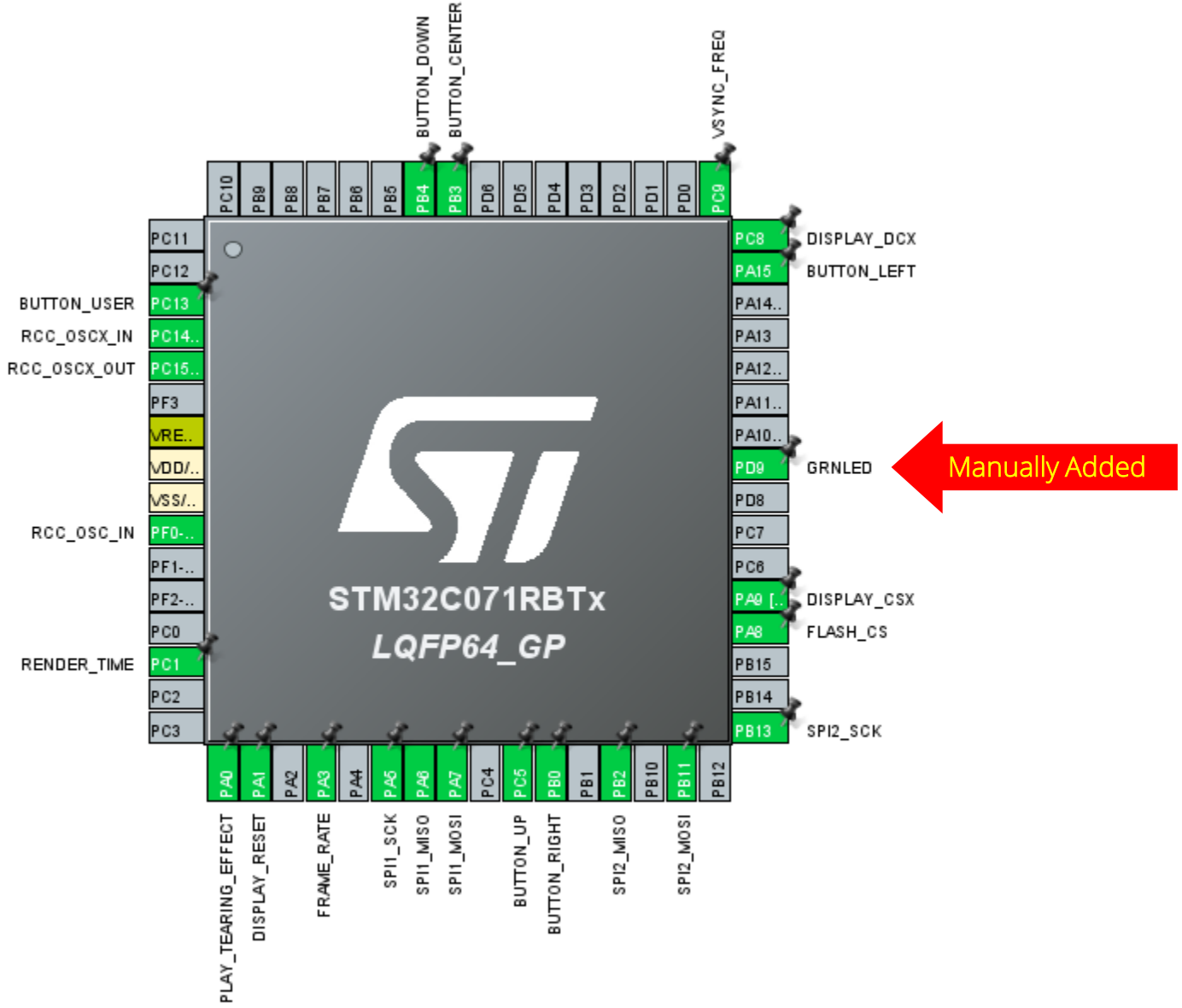
Color Depth: 16 bit

Versions: v 3.0.1

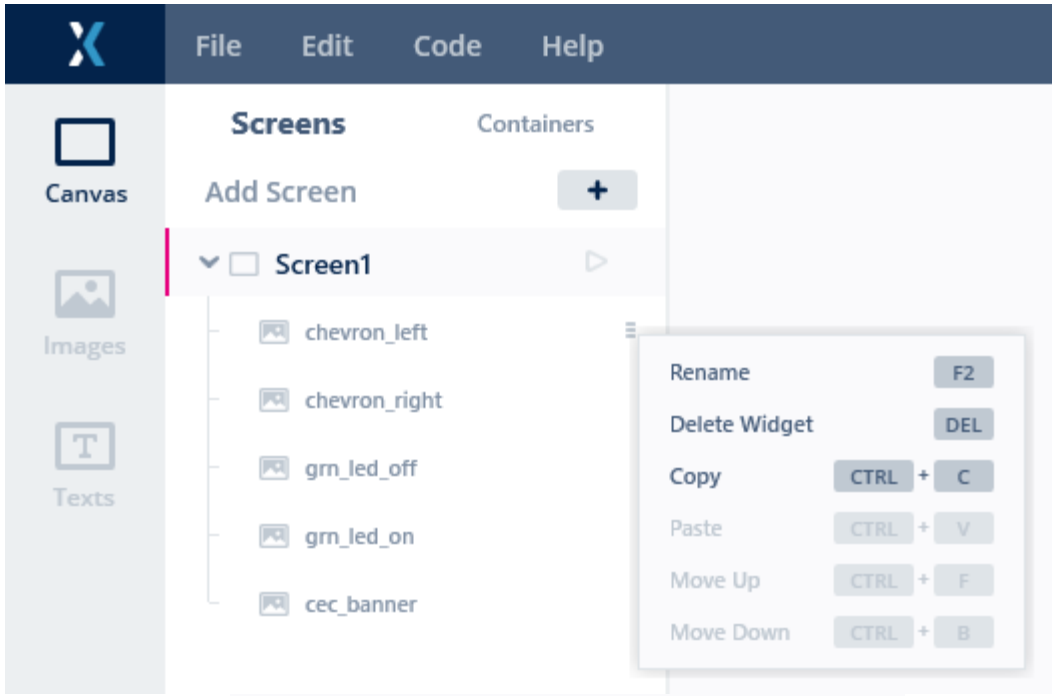
Resolution: 240 x 320 px

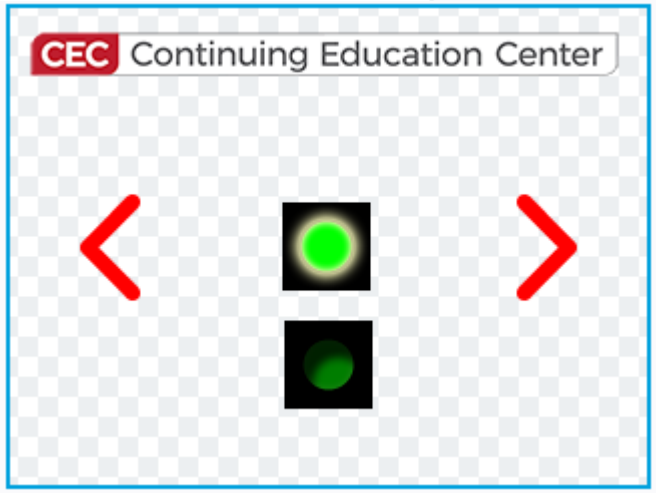
Create

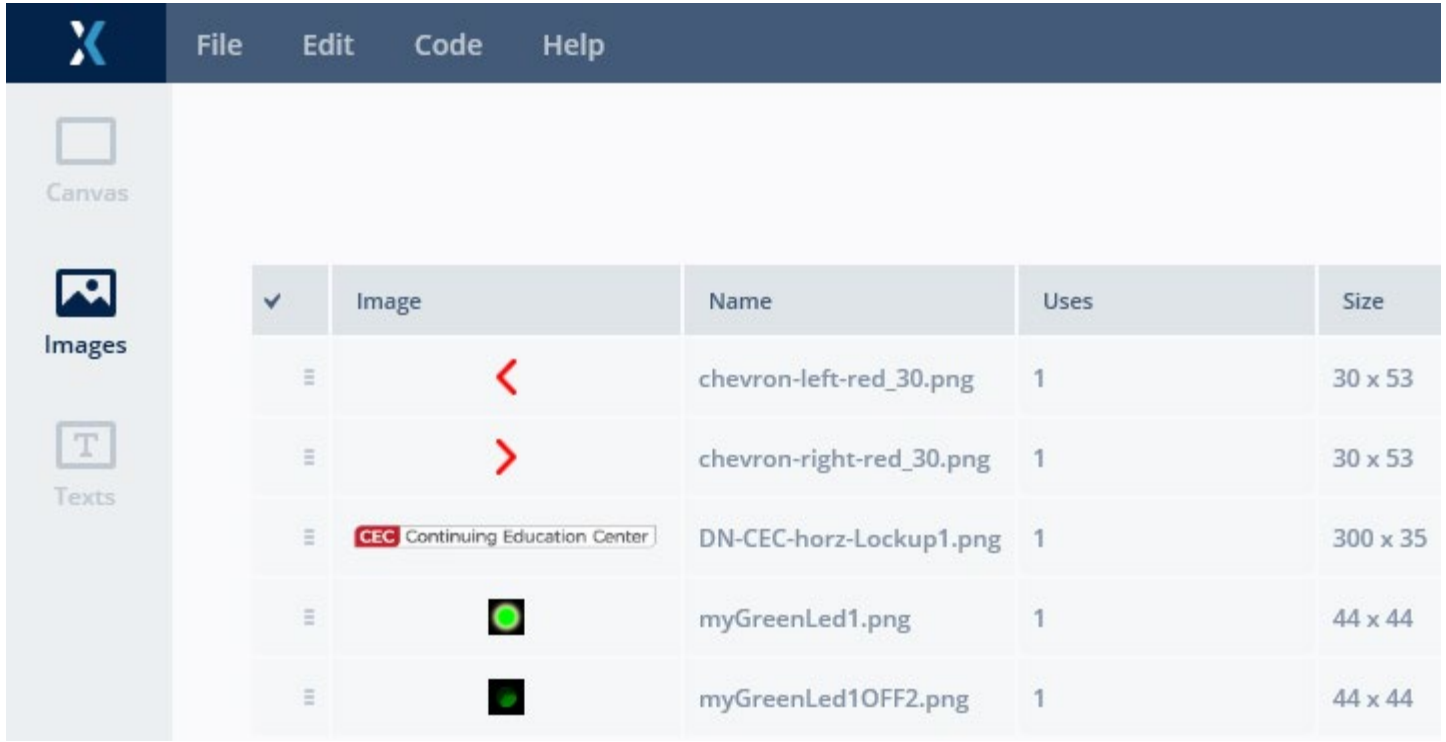
Create a New NUCLEO-C071RB TouchGFX Project



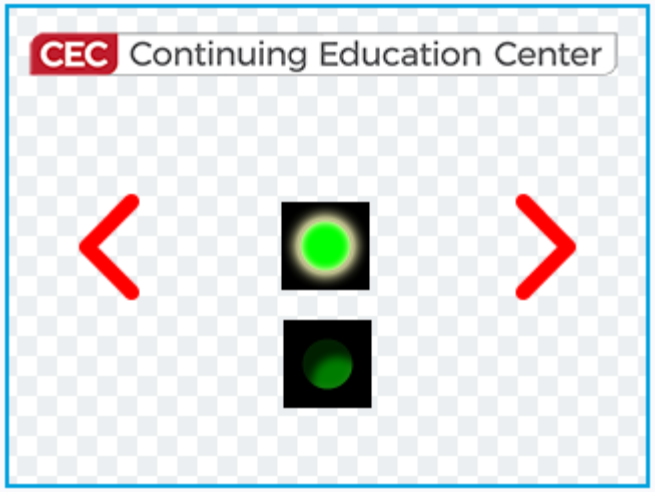
Layout the Screen



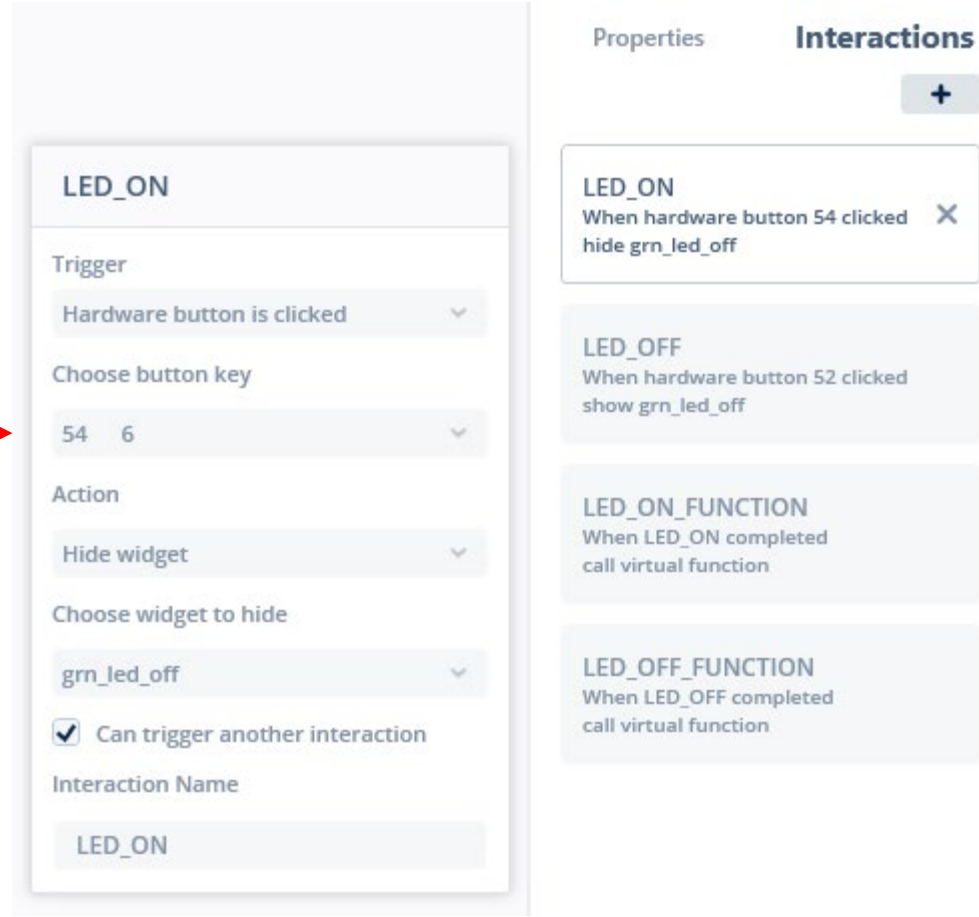




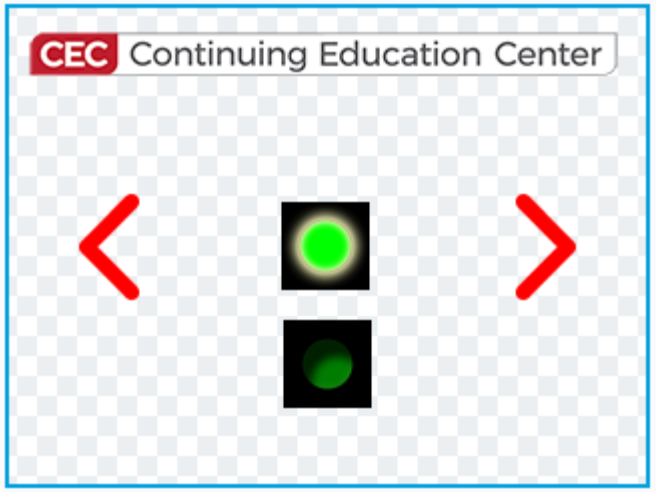
Define the Interactions



Key	Code
Left	'4'
Right	'6'
Up	'8'
Down	'2'
Center	'5'
Blue User Button	'0'



Define the Interactions



Key	Code
Left	'4'
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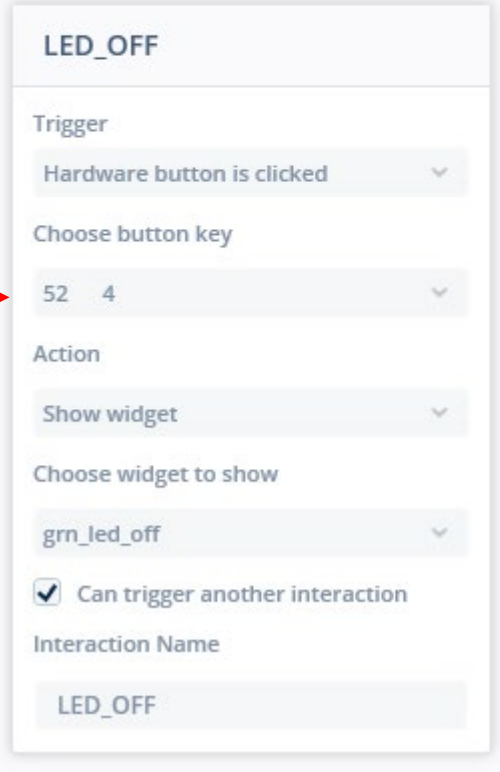
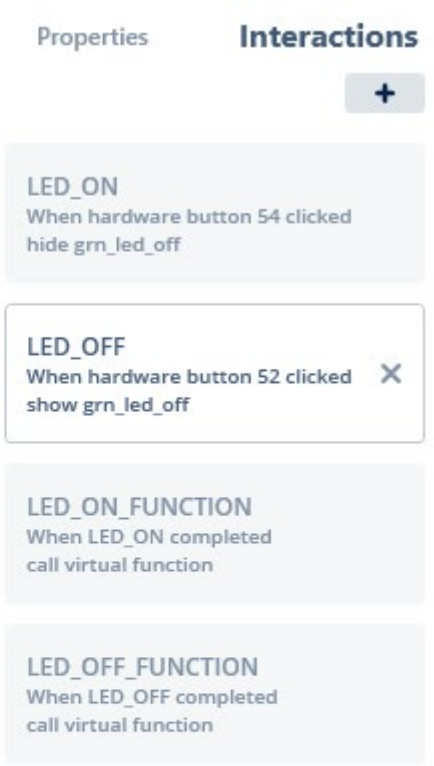
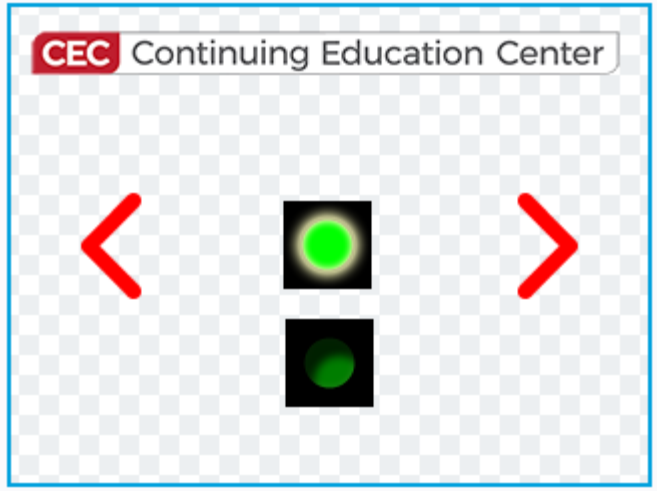
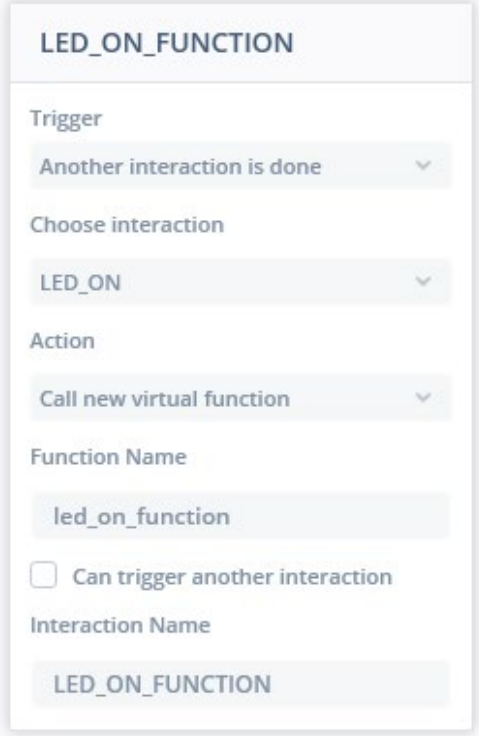


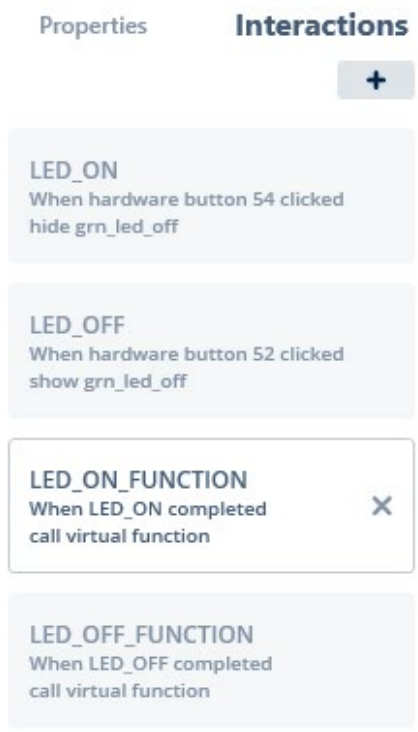


Define the Interactions

```
void Screen1View::led_on_function()
{
 HAL_GPIO_WritePin(GRNLED_GPIO_Port, GRNLED_Pin, GPIO_PIN_SET);
}
```

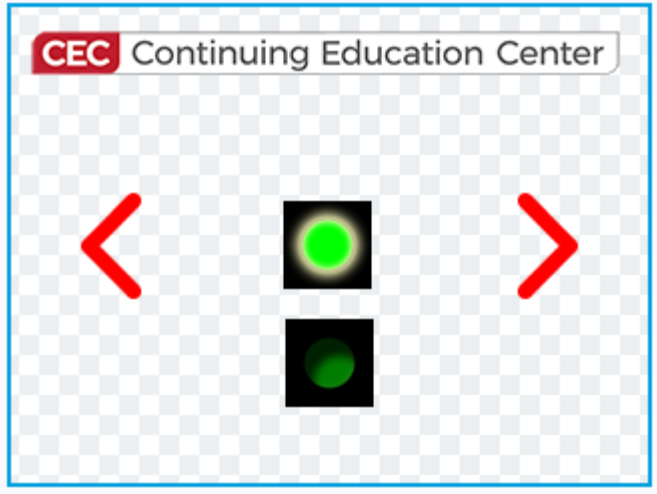




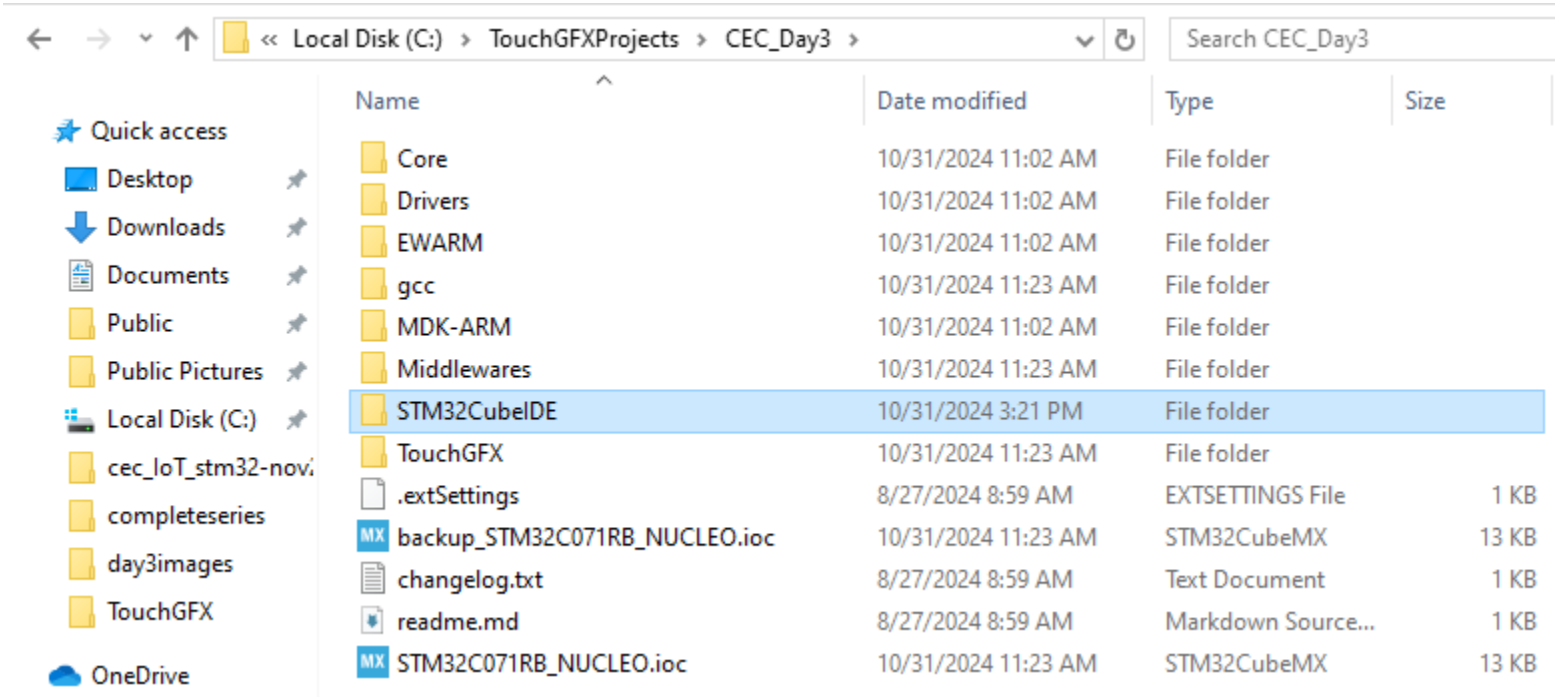


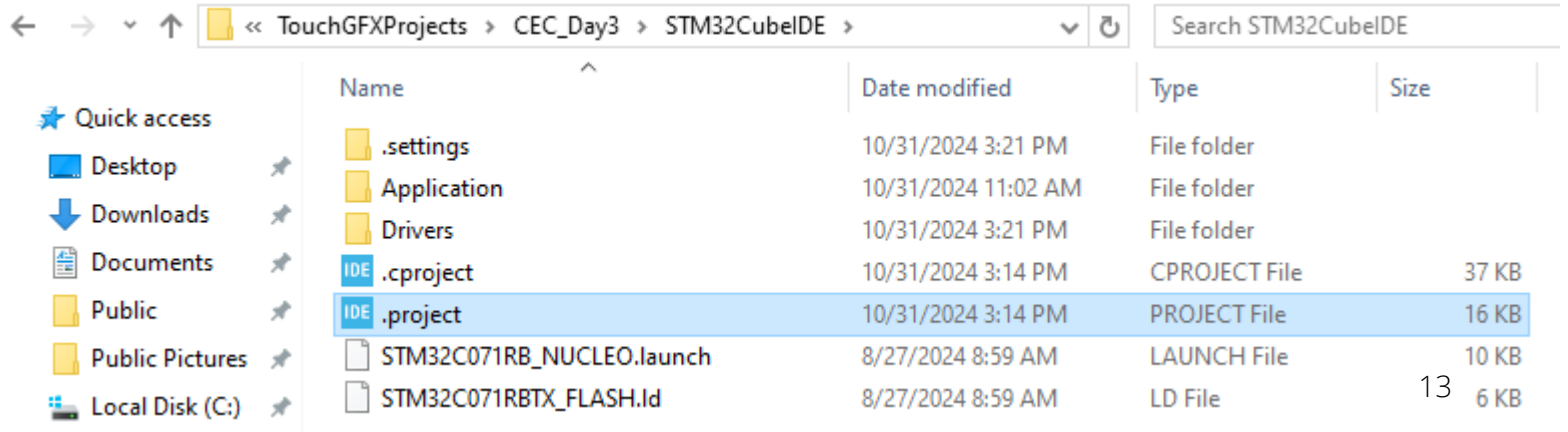
Define the Interactions

```
void Screen1View::led_off_function()
{
 HAL_GPIO_WritePin(GRNLED_GPIO_Port, GRNLED_Pin, GPIO_PIN_RESET);
}
```

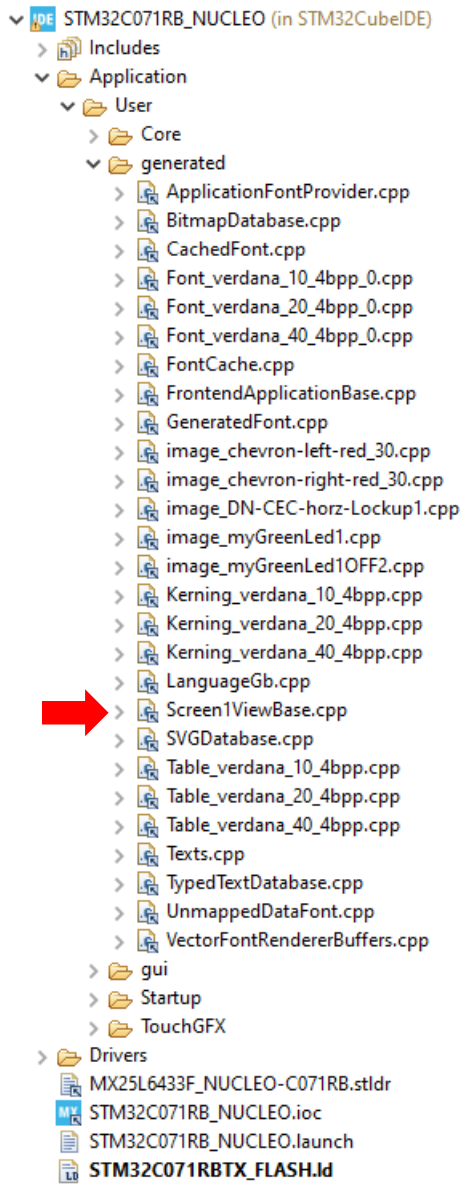


Customize the NUCLEO-C071RB TouchGFX Project

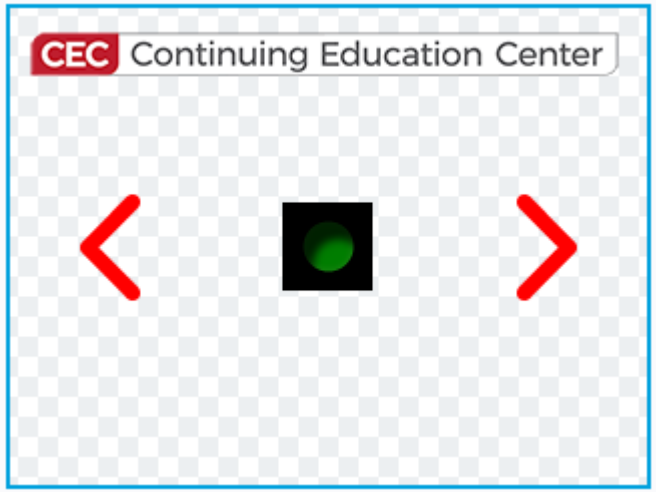




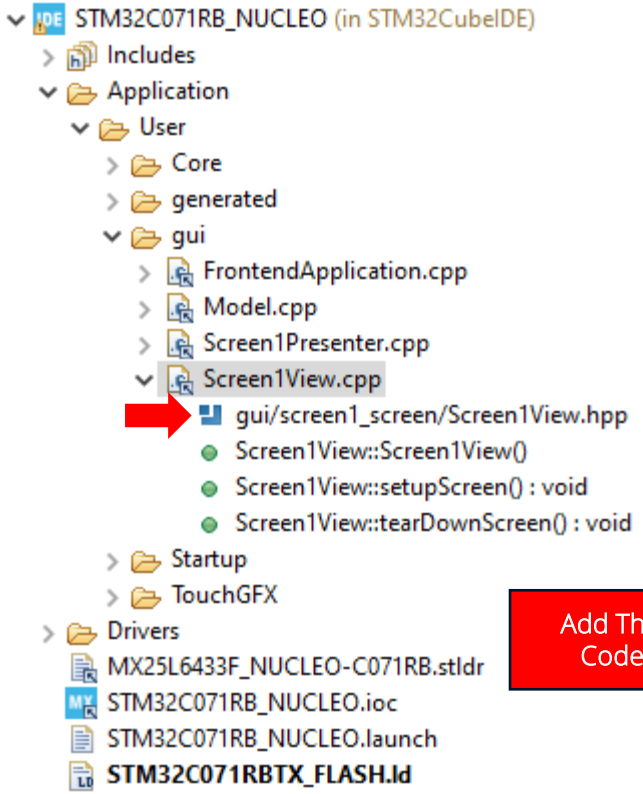
Customize the NUCLEO-C071RB TouchGFX Project




```
Screen1ViewBase::Screen1ViewBase()
{
  __background.setPosition(0, 0, 320, 240);
  __background.setColor(touchgfx::Color::getColorFromRGB(0, 0, 0));
  add(__background);

  cec_banner.setXY(9, 7);
  cec_banner.setBitmap(touchgfx::Bitmap(BITMAP_DN_CEC_HORZ_LOCKUP1_ID));
  add(cec_banner);

  grn_led_on.setXY(137, 98);
  grn_led_on.setBitmap(touchgfx::Bitmap(BITMAP_MYGREENLED1_ID));
  add(grn_led_on);

  grn_led_off.setXY(138, 98);
  grn_led_off.setBitmap(touchgfx::Bitmap(BITMAP_MYGREENLED1OFF2_ID));
  add(grn_led_off);

  chevron_right.setXY(254, 94);
  chevron_right.setBitmap(touchgfx::Bitmap(BITMAP_CHEVRON_RIGHT_RED_30_ID));
  add(chevron_right);

  chevron_left.setXY(36, 94);
  chevron_left.setBitmap(touchgfx::Bitmap(BITMAP_CHEVRON_LEFT_RED_30_ID));
  (chevron_left);
}
```



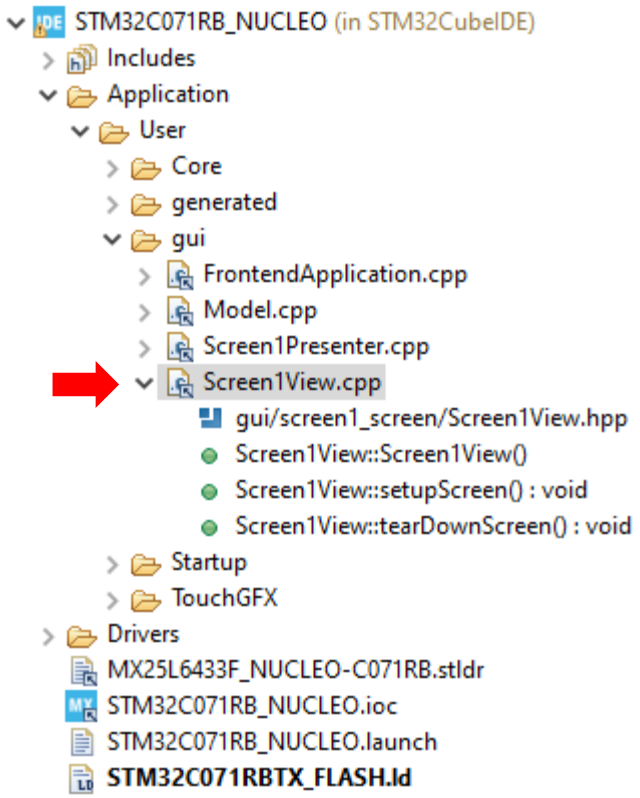
Customize the NUCLEO-C071RB TouchGFX Project



Add This Code

```
#ifndef SCREEN1VIEW_HPP
#define SCREEN1VIEW_HPP

#include <gui_generated/screen1_screen/Screen1ViewBase.hpp>
#include <gui/screen1_screen/Screen1Presenter.hpp>

class Screen1View : public Screen1ViewBase
{
 public:
 Screen1View();
 virtual ~Screen1View() {}
 virtual void setupScreen();
 virtual void tearDownScreen();
 virtual void led_on_function();
 virtual void led_off_function();
 protected:
};

#endif // SCREEN1VIEW_HPP
```

Customize the NUCLEO-C071RB TouchGFX Project



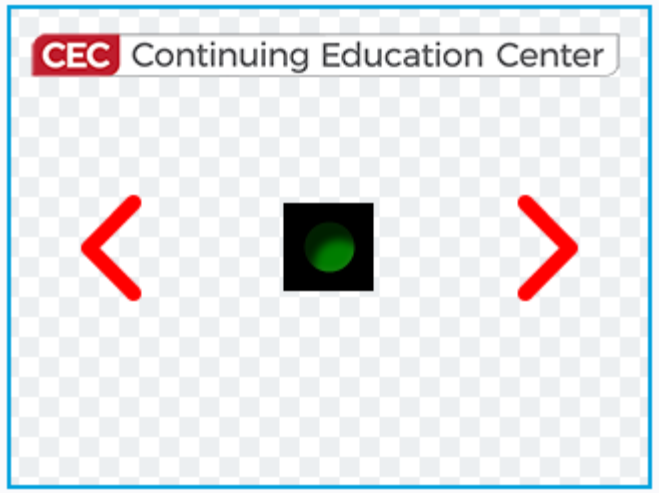
Add This Code

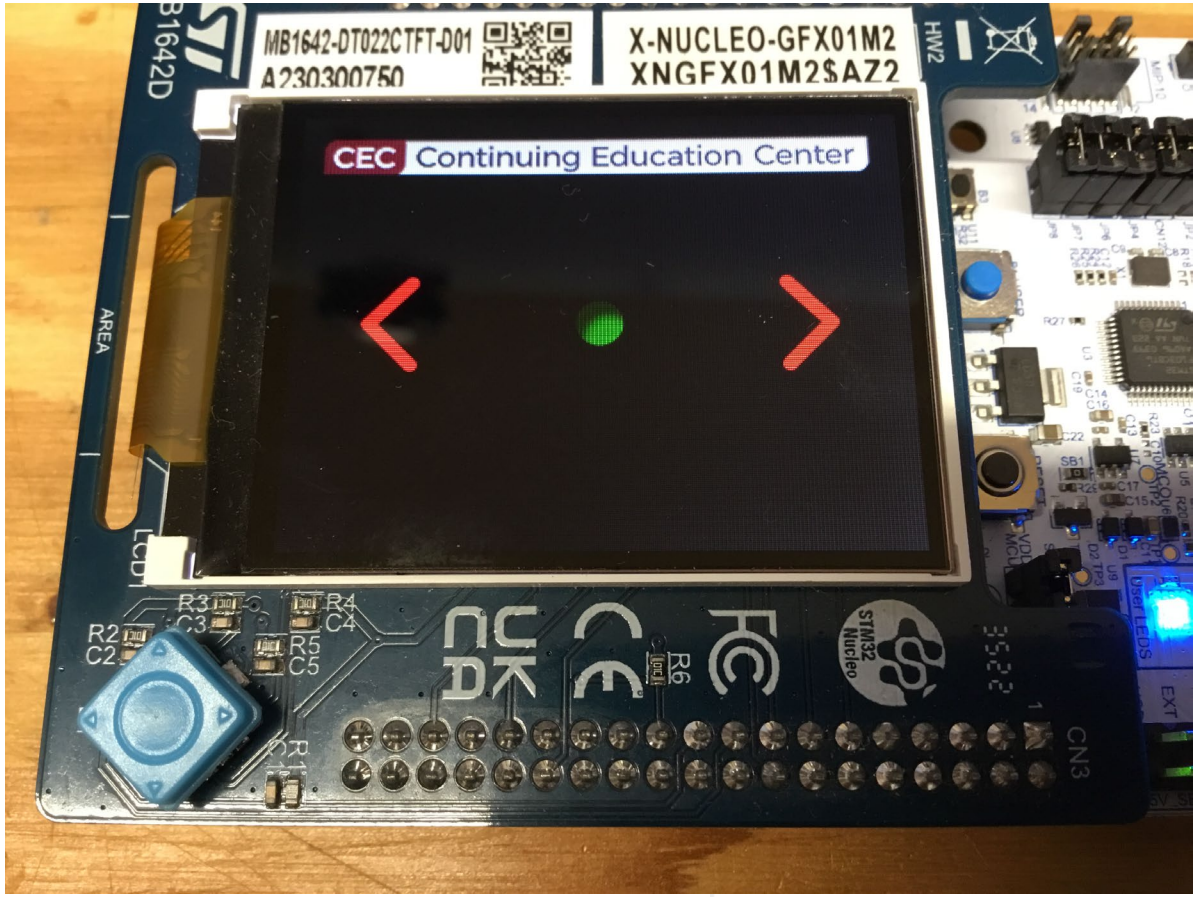
```
#include <gui/screen1_screen/Screen1View.hpp>
#include "main.h"

Screen1View::Screen1View()
{

}

void Screen1View::setupScreen()
{
 Screen1ViewBase::setupScreen();
}

void Screen1View::tearDownScreen()
{
 Screen1ViewBase::tearDownScreen();
}
```

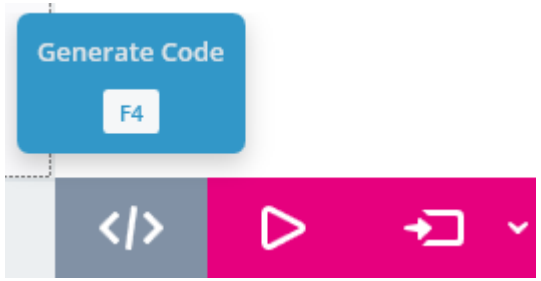
Add This Code

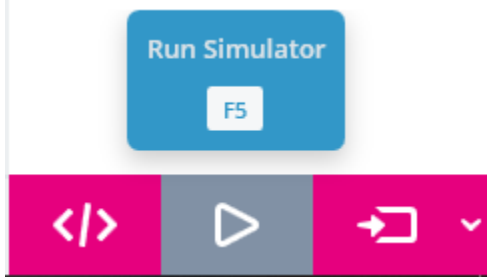
```
void Screen1View::led_on_function()
{
 HAL_GPIO_WritePin(GRNLED_GPIO_Port, GRNLED_Pin, GPIO_PIN_SET);
}

void Screen1View::led_off_function()
{
 HAL_GPIO_WritePin(GRNLED_GPIO_Port, GRNLED_Pin, GPIO_PIN_RESET);
}
```

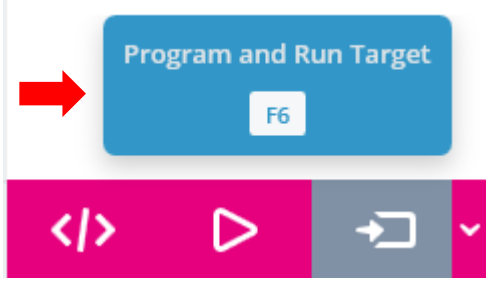
Program and Run the TouchGFX Project



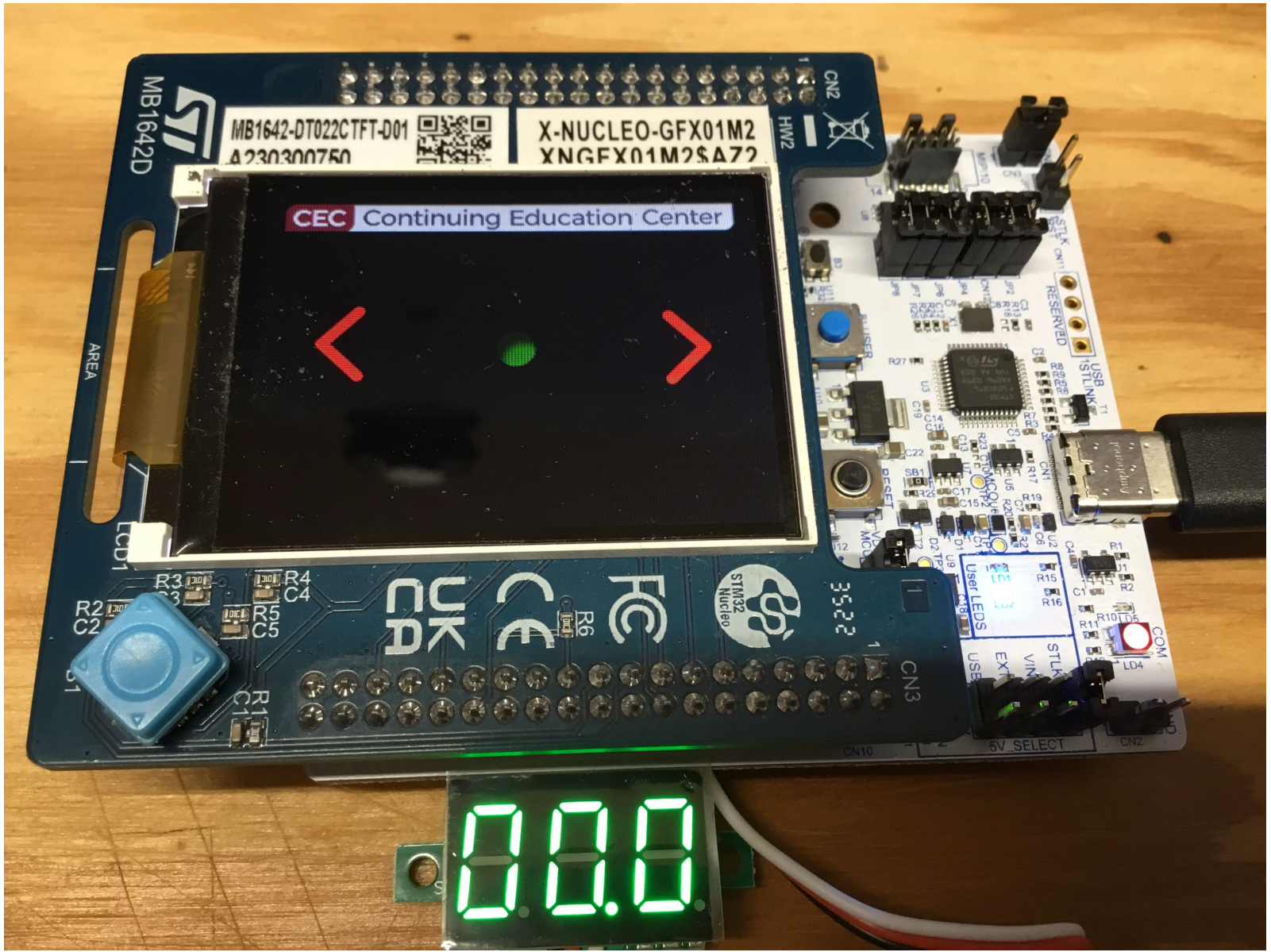




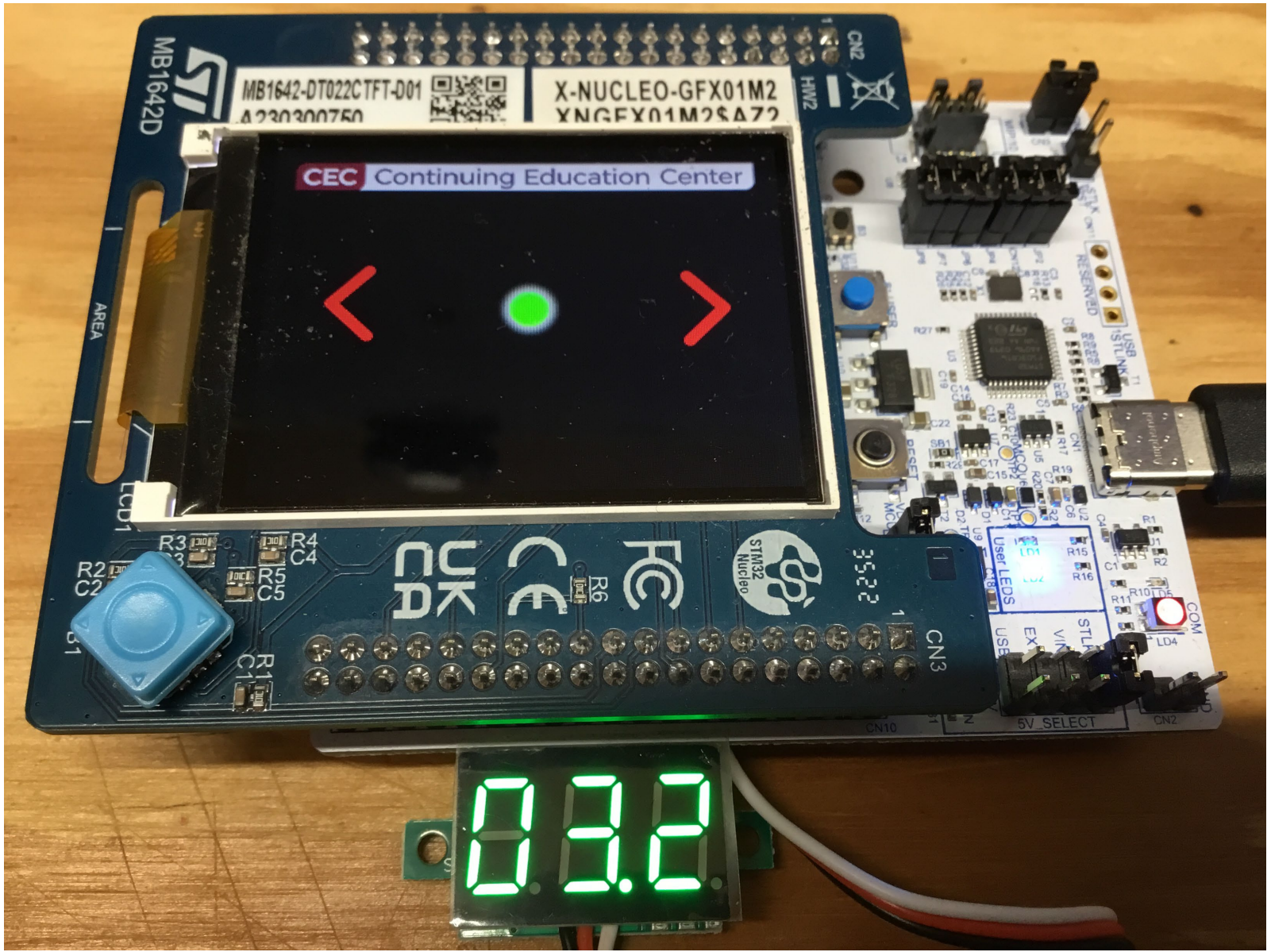




Program and Run the TouchGFX Project



Program and Run the TouchGFX Project



Create a New STM32U5G9J-DK2 TouchGFX Project

STM32U5G9J DK2

STMicroelectronics

Operating system: FreeRTOS

Description

Chip/board specifications:
- 160 MHz CPU
- Chrom-ART
- NeoChromVG GPU
- 3 MB internal SRAM
- 4 MB internal flash
- 128 MB external O-SPI flash
- RGB display interface

Framebuffer setup:
- Double framebuffers in internal SRAM
- 800 x 480 px resolution
- 16-bit color depth

Software tools:

Application Name

CEC_Day3_U5G9J

Application Directory

C:\TouchGFXProjects

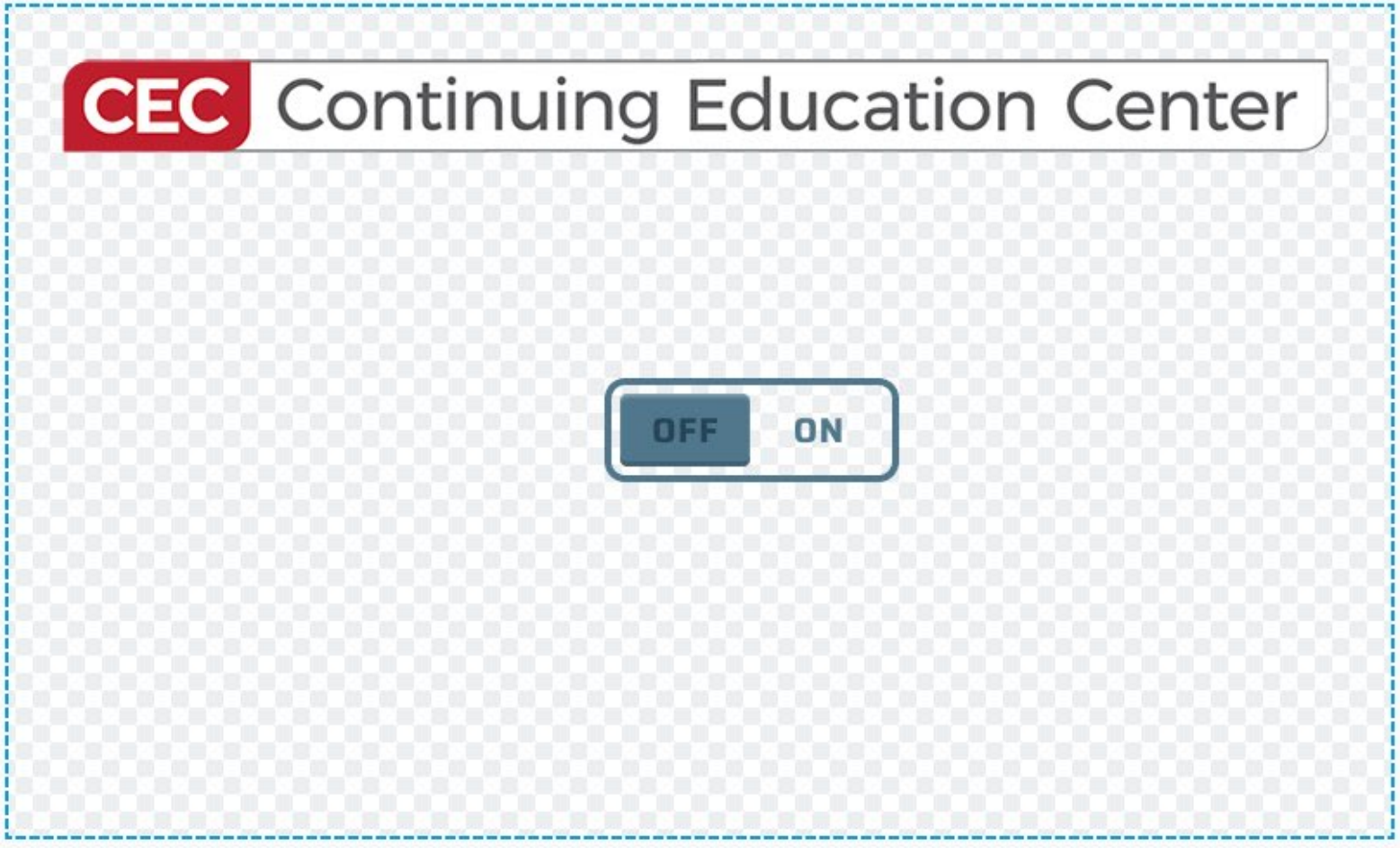
Color Depth: 16 bit

Versions: v 3.0.6

Resolution: 800 x 480 px

Create

Layout the Screen and Define the Interactions



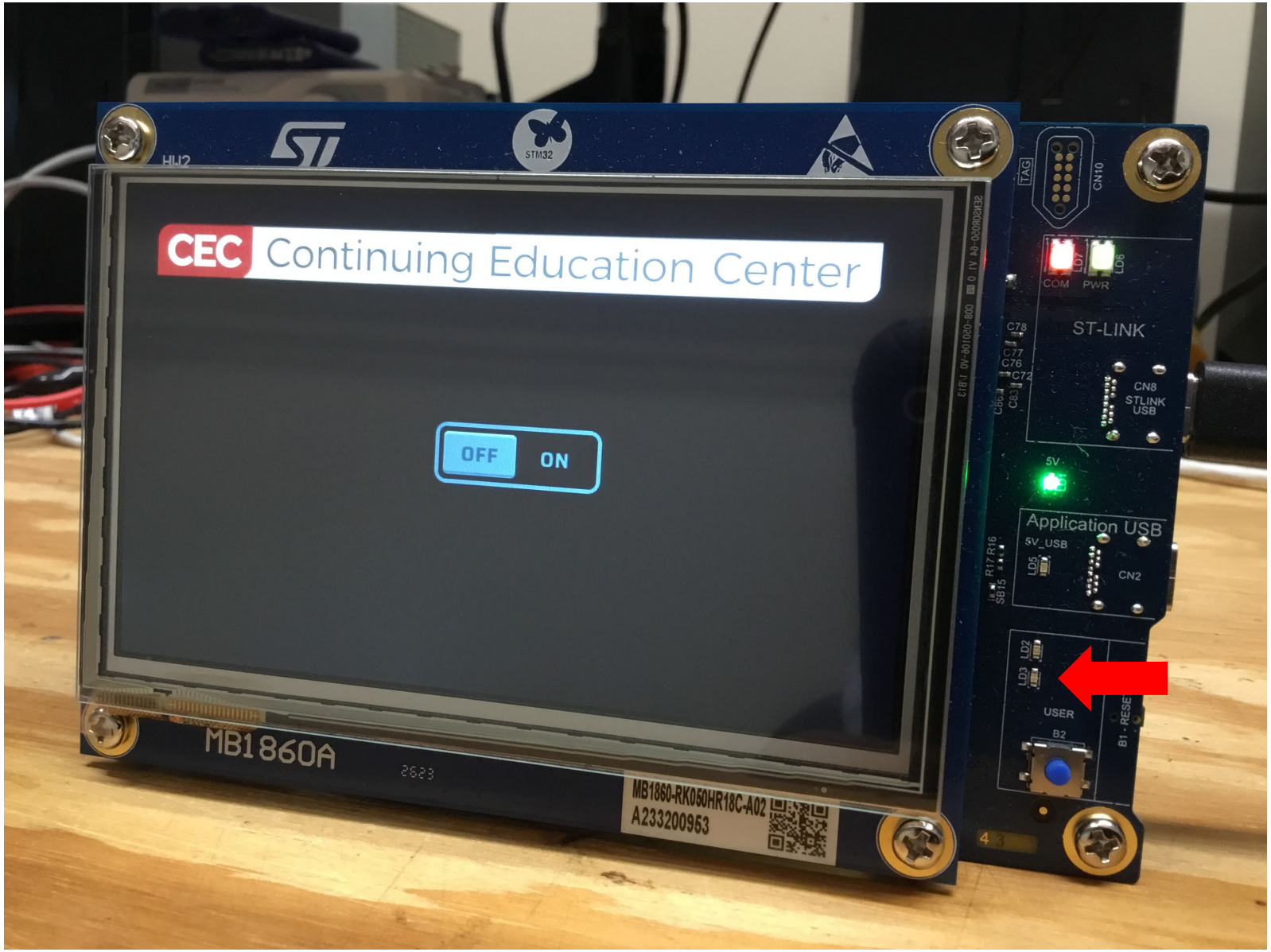
Customize the STM32U5G9J-DK2 TouchGFX Project

```
class Screen1View : public Screen1ViewBase
{
 public:
 Screen1View();
 virtual ~Screen1View() {}
 virtual void setupScreen();
 virtual void tearDownScreen();
 virtual void toggle_led();
 protected:
};
```

Add

```
void Screen1View::toggle_led()
{
 HAL_GPIO_TogglePin(GPIOD, USER_LD3_GREEN_Pin);
}
```

Program and Run the Project



Program and Run the Project

Next Time…

MORE TO COME..

Thank you for attending!!!

Please consider the resources below:

- Today's Download Package
- STM32C071RB Datasheet
- NUCLEO-C071RB Schematic
- STM32U5G9J-DK2 User Manual
- STM32U5G9J Schematic

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