LVGL E-Bike Demo on i.MX RT1060-EVK

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1. Introduction

This application note introduces users on how to implement an E-Bike dashboard using GUI Guider and run the application on the i.MX RT1060-EVK evaluation kit. To replicate this application design and demonstration, you need:

- GUI Guider version 1.3.1 or later (available at www.nxp.com/gui-guider)

- MCUXpresso version 11.5.0 or later

- i.MX RT1060 SDK package version 2.11.0

- MIMXRT1060-EVK evaluation kit

- Rocktech RK043FN02H-CT LCD display

- (A new LCD, RK043FN66HS-CTG, is supported as well. User can select RK043FN66HS in GUI Guider and set DEMO_PANEL_RK043FN66HS for the LCD configuration in MCUXpresso SDK)

Contents

2. E-Bike demo overview

The E-bike Demo consists of three main screens:

- Overview

- Ride details 1

- Ride details 2

Each screen contains a lot of ride information and users can easily browse the LCD panel to view the information displayed.
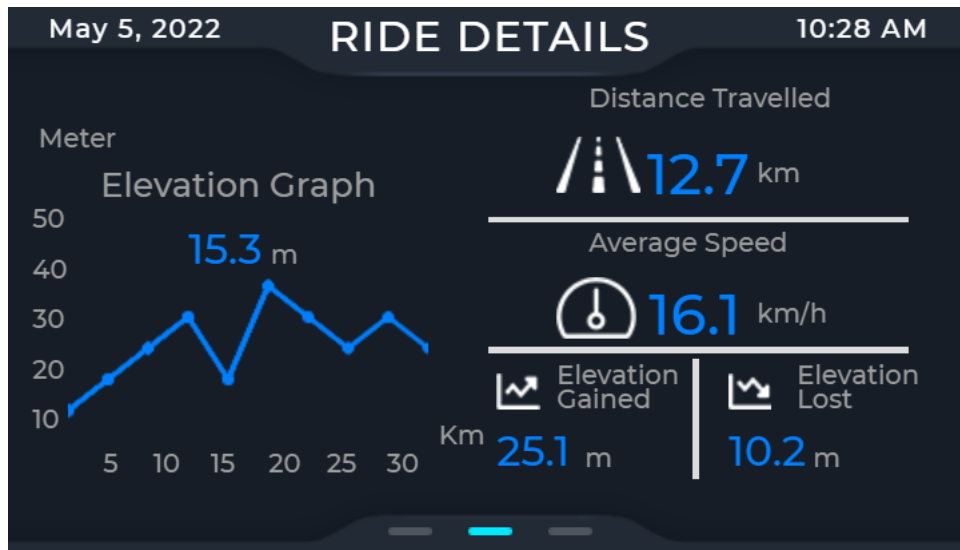

Figure 1. **Overview**

Figure 2. **Ride Details 1**

Figure 3. **Ride details 2**

2.1. **E-Bike GUI Guider project**

Launch the GUI Guider and select "Import a local project". Browse to GUI Guider project file of E-bike demo "evkmimxrt1060_ebike_lvgl8\ebike_demo_gg\ Ebike_lvgl8.guiguider".
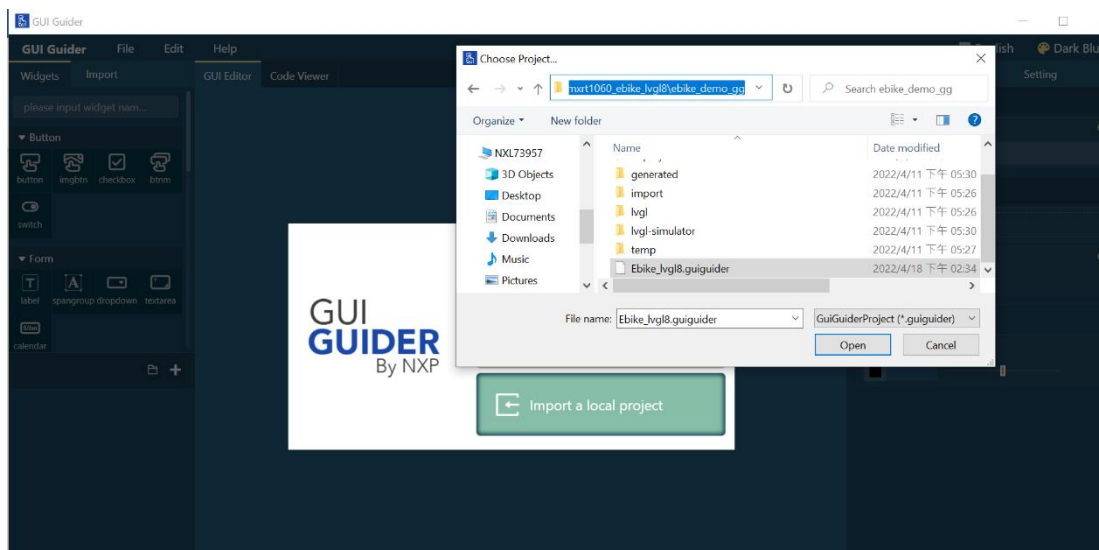

Figure 4. **Importing a local project**

The first screen of E-Bike demo is Overview, there are four LVGL widgets namely image, label, meter and arc widgets. Image widget is used for the background image and all icons. Label widget is used to display the text. Meter and Arc widgets are used to design the speedometer.

Figure 5. **Overview**

In Ride Details 1, besides image and label widgets are used for image/icon and text display. The chart widget is used to design elevation graph.

Figure 6. **Ride details 1**
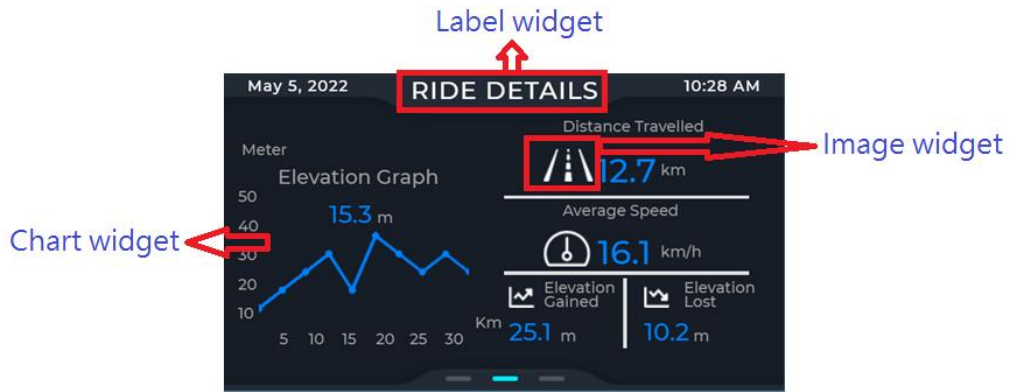
Ride Details 2 comprises of image, label and arc widgets to display riding information.

Figure 7. **Ride details 2**

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All of these screens have an image button on the top layer of the screen and the opacity attribute of image buttons is set to 0 as transparent. These image buttons uses handle touch events to load the next screen.
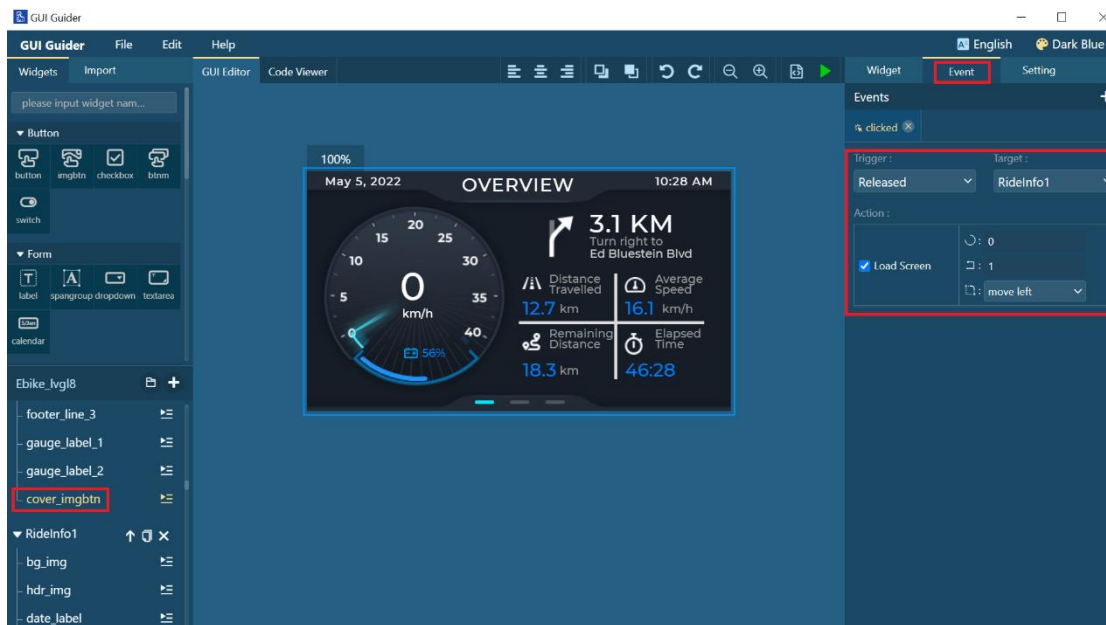
Figure 8. **Event handler of image button**

When finishing the GUI design, click "generate_code" and wait for generation of the code. Click on "File"→ "Export Code" → "MCUXpresso Code" → and navigate to the the lvgl_guider example of from the SDK. The source files are then exported into this example, allowing further application customization and development.
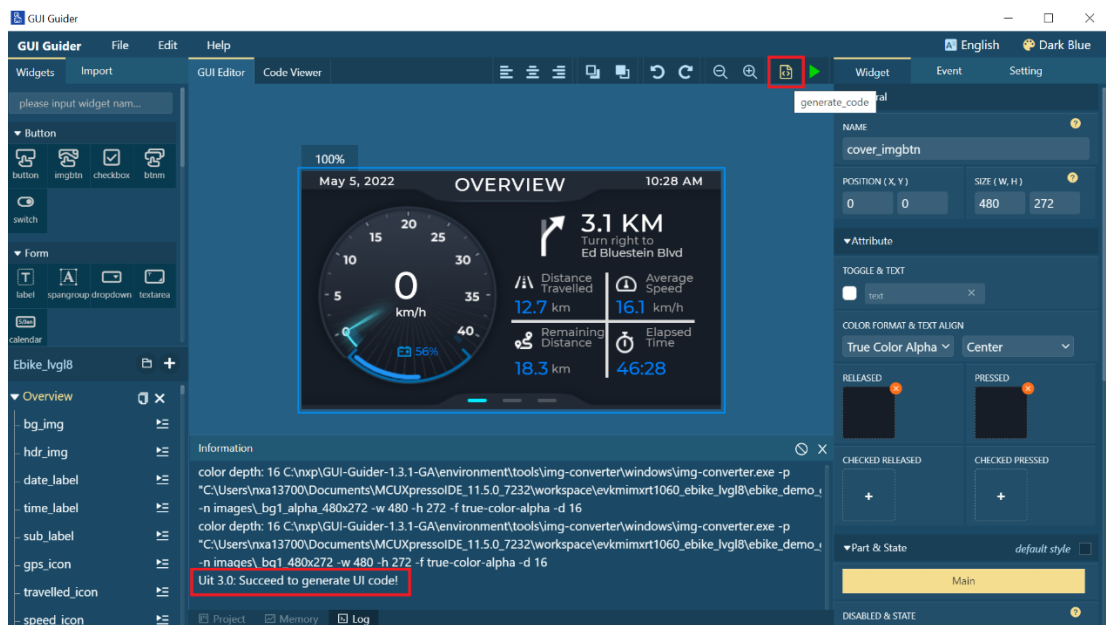
Figure 9. **Generate code**
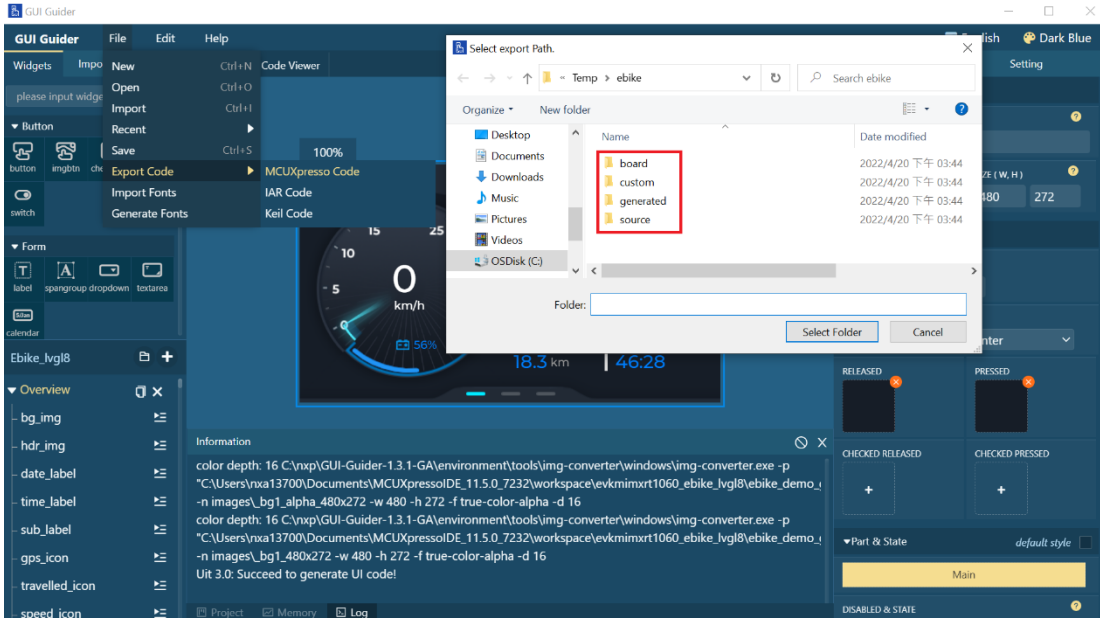
Figure 10. **Export code into lvgl_guider example of SDK**

2.2. **E-Bike MCUXpresso project**

Launch MCUXpresso IDE and select "Import project(s) from file system". Click on "Browser" and navigate to the E-Bike project folder. Click "finish" to import E-Bike project into MCUXpresso IDE.
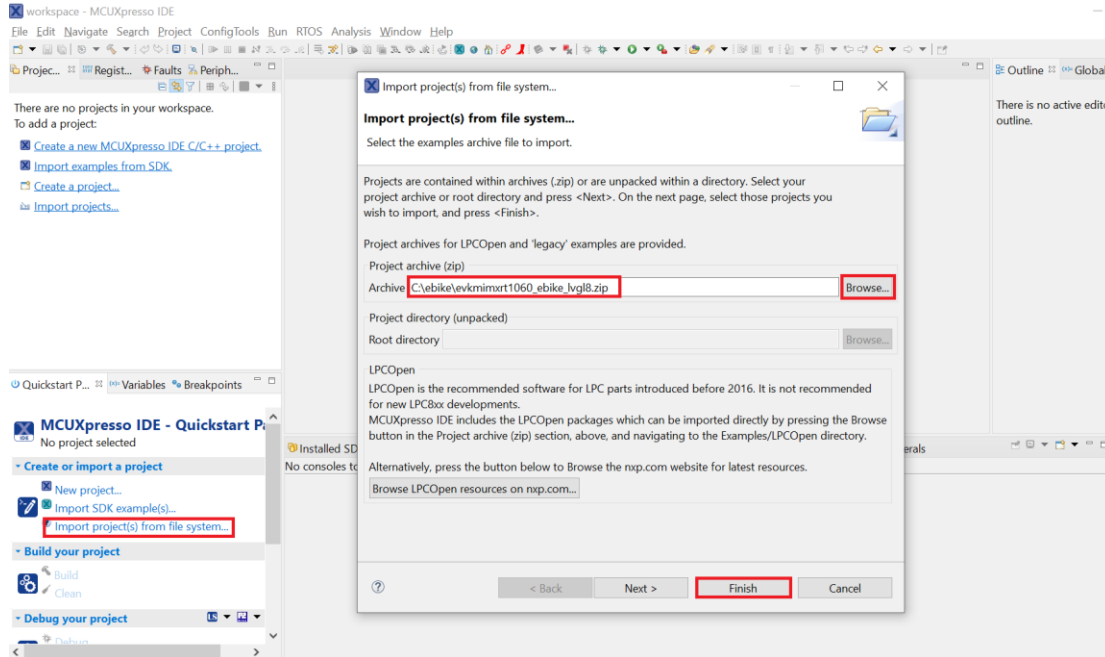

Figure 11. **Import E-Bike project into MCUXpresso IDE.**

2.2.1. **File structure**

The E-Bike demo is an example for the i.MX RT1060-EVK and is based on the lvgl_guider example in the i.MX RT1060 SDK v2.11.0. The folder structure follows the standard of for MCUXpresso SDK examples. The folders which are created the *generated* and *source* are the important one.
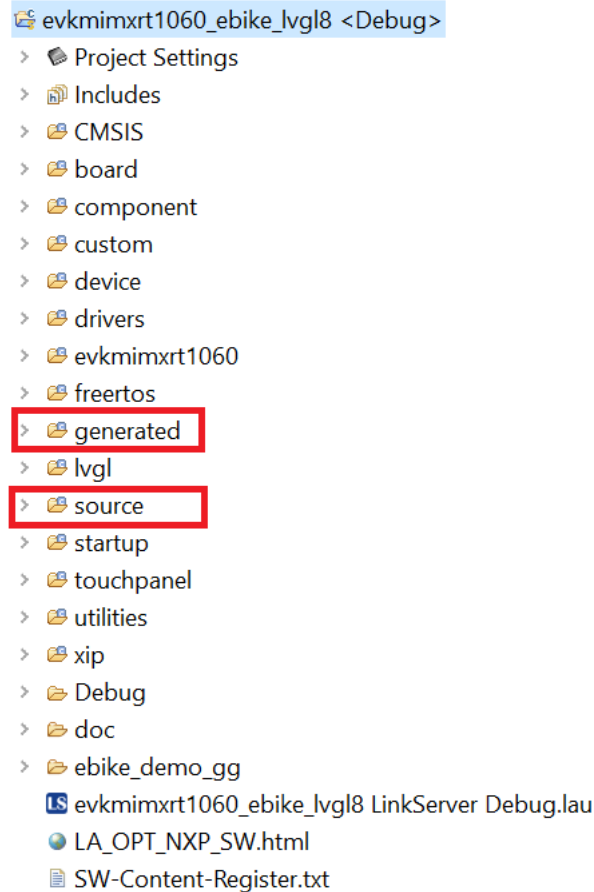
Figure 12. **File structure of E-Bike demo project**

The *generated* folder contains files generated by the GUI Guider. These files are modified by GUI Guider when rebuilding the GUI Guider project and exporting code here. The *source* folder contains the manually coded source files for information update, updating of label, meter, and chart widgets in *gui_events_handler.c/h*.
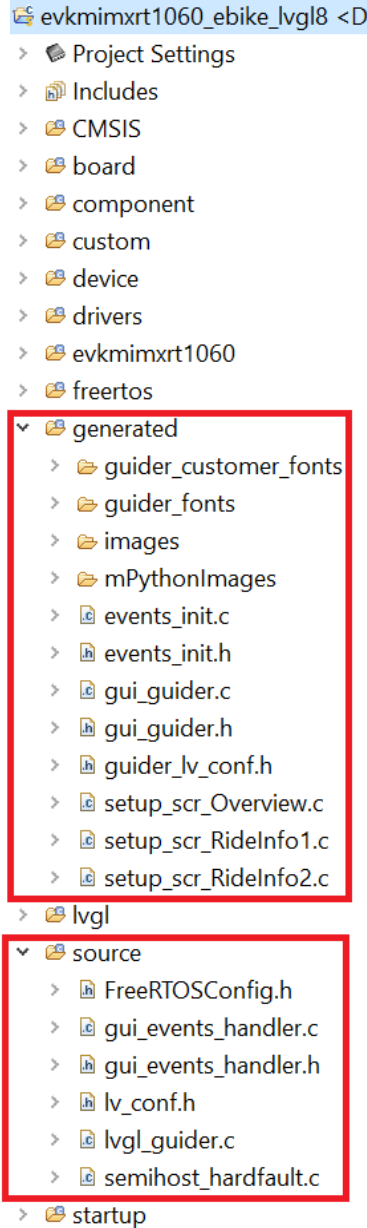
Figure 13. **Source files in *generated* and *source* folders**

2.2.2. **Loading the project to the board**

To load the project to the board, click the ***Build*** icon to build the project first. With the i.MX RT1060-EVK evaluation kit connected to the PC, click the ***Debug*** icon to load the project to the i.MX RT1060-EVK.
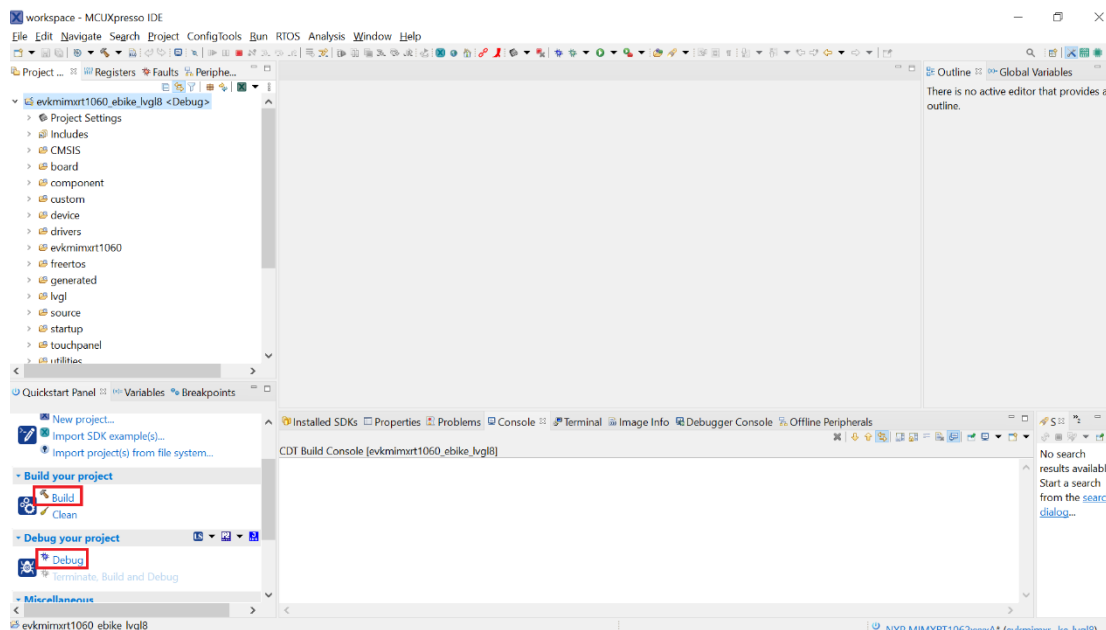
Figure 14. **Load the project to the board**

3. Modify the E-Bike demo

There are two ways to modify the E-Bike demo:

1. Via the GUI Guider

2. Via the source code directly

The first way (via the GUI Guider) is the preferred method to modify the GUI of E-Bike demo. It is easy to add, delete, or modify the LVGL widgets to change the GUI design via the GUI Guider. Some situations, however, require the source code to be modified manually. Typically it is required when a function that GUI Guider cannot provide is needed (such as an event trigger from an MCU peripheral).

4. Conclusion

This document shows E-Bike demo development using GUI Guider and LVGL. Export the generated code into lvgl_guider example of SDK and then run the E-Bike demo on i.MX RT1060-EVK via MCUXpresso IDE. Additionally, the source code has been examined and a description of how to modify the source has been outlined. It provides a helpful jumping-off point for the application development.

For additional information regarding the GUI Guider, see www.nxp.com/gui-guider. If you have questions regarding this demo or need support, please submit a question to the NXP community at community.nxp.com.

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