## **恩智浦半导体** 应用笔记

# 基于i.MX RT1060-EVK的LVGL电动自行车 演示工程

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# 1. 简介

本应用笔记向用户介绍了如何使用GUI Guider实现 电动自行车仪表盘,并在i.MX RT1060-EVK评估 套件上运行该应用程序。要复制这个应用程序设计 和演示,您需要:

- GUI Guider 1.3.1版或更新版本(可在 www.nxp.com/gui-guider 获得)
- MCUXpresso 11.5.0版或更新版本
- i.MX RT1060 SDK软件包2.11.0版
- MIMXRT1060-EVK评估套件
- Rocktech RK043FN02H-CT LCD显示屏
- (也支持新的LCD, RK043FN66HS-CTG。
   用户可以在GUI Guider中选择RK043FN66HS,
   并在MCUXpresso SDK中为LCD配置设置
   DEMO\_PANEL\_RK043FN66HS)

# 2. 电动自行车演示工程概述

此电动自行车演示工程由三个主要屏幕组成:

- 综合
- 骑行详情1
- 骑行详情2

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#### 电动自行车演示工程概述



每个屏幕都包含大量的骑行信息,用户可以轻松地浏览液晶面板,查看显示的信息。

图1. 综合



图2. 骑行详情1

电动自行车演示工程概述



图3. 骑行详情2

### 2.1. 电动自行车GUI Guider工程

启动GUI Guider并选择"导入本地工程"。浏览到电动自行车演示工程的GUI Guider工程文件 "evkmimxrt1060\_ebike\_lvgl8\ebike\_demo\_gg Ebike\_lvgl8.guiguider"。

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图4. 导入一个本地工程

电动自行车演示工程的第一个屏幕是综合,有四个LVGL小部件,即图像、标签、仪表和弧形小部件。图像小部件用于显示背景图像和所有图标。标签小部件用于显示文本。仪表和弧线小部件用于设计车速里程表。





在骑行详情1中,除了图像和标签小部件用于图像/图标和文本显示。图表小部件用于设计高程图。



图6. 骑行详情1

骑行详情2包括图像、标签和弧形小部件来显示骑行信息。



图7. 骑行详情2

#### 基于i.MX RT1060-EVK的LVGL电动自行车演示,第0版,2022年6月

所有这些屏幕的顶层都有一个图像按钮,图像按钮的不透明度属性被设置为0,为透明。这些图像按钮使用手触摸事件来加载下一个屏幕。



图8. 图像按钮的事件处理程序

完成GUI设计后,点击"generate\_code",等待代码的生成。点击"文件"→"导出代码" → "MCUXpresso代码"→并导航到SDK中的lvgl\_guider示例。然后源文件被导出到这个例 子中,允许进一步的应用程序定制和开发。



图9. 生成代码

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#### 电动自行车演示工程概述

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图10. 将代码导出到SDK的lvgl\_guider示例中

### 2.2. 电动自行车MCUXpresso工程

启动MCUXpresso IDE并选择"从文件系统导入工程"。点击"浏览器"并导航到E-Bike工程 文件夹。点击"完成",将电动自行车工程导入MCUXpresso IDE。



图11. 将电动自行车工程导入MCUXpresso IDE

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### 2.2.1. 文件结构

电动自行车演示工程是i.MX RT1060-EVK的一个例子,它基于i.MX RT1060 SDK v2.11.0中的 lvgl\_guider示例。文件夹结构遵循MCUXpresso SDK示例的标准。生成的(generated)文件夹 和源文件(source)文件夹都是很重要的。



#### 图12. 电动自行车演示工程的文件结构

生成文件夹包含GUI Guider生成的文件。这些文件是GUI Guider在重建GUI Guider工程并在此导出代码时修改的。源文件夹包含手动编码的源代码文件,用于信息更新,更新 gui\_events\_handler.c/h中的标签、仪表和图表小部件。

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图13. 生成文件夹和源文件夹中的源文件

### 2.2.2. 将工程加载到电路板上

要将工程加载到评估板上,首先点击Build图标来构建工程。在i.MX RT1060-EVK评估套件连接到PC的情况下,点击调试(Debug)图标将工程加载到i.MX RT1060-EVK。



图14. 将工程加载到评估板上

# 3. 修改电动自行车演示工程

有两种方法可以修改电动自行车的演示工程:

- 1. 通过GUI Guider
- 2. 直接通过源代码

第一种方法(通过GUI Guider)是修改电动自行车演示工程GUI的首选方法。通过GUI Guider,可以很容易地添加、删除或修改LVGL小部件来改变GUI设计。然而,在某些情况下,需要手动修改源代码。通常当GUI Guider不能提供需要的功能时(如来自MCU外设的事件触发),就需要这样做。

# 4.总结

本文档展示了使用GUI Guider和LVGL进行的电动自行车演示工程的开发。将生成的代码导出到SDK的lvgl\_guider示例中,然后通过MCUXpresso IDE在i.MX RT1060-EVK上运行电动自行车 演示。此外,还对源代码进行了检验,并概述了如何修改源代码。它为应用程序的开发提供了 一个有帮助的跳板。

有关GUI Guider的更多信息,请参见<u>www.nxp.com/gui-guider</u>。如果您对演示有疑问或需要支持, 请在<u>community.nxp.com</u>向恩智浦社区提交问题。

总结

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