UM11581

Arduino Shields GUI and firmware installation

Rev. 1.0 — 22 February 2021 **User guide**

Document information

Information	Content
Keywords	MIMXRT1050-EVK, LPC55S69-EVK, 8MMINILPD4-EVK
Abstract	This document describes the Installation procedure for the Arduino Shields GUI and the Firmware for the MIMXRT1050-EVK, LPC55S69-EVK and 8MMINILPD4-EVK. PCA995X GUI is used as reference for installation.

Revision history

Rev	Date	Description
v.1.0	20210222	Initial version

1 Introduction

This document describes the Installation procedure for the Arduino Shields GUI and the firmware for MIMXRT1050-EVK, LPC55S69-EVK, and 8MMINILPD4-EVK which supports the family of Arduino Development Shields. The EVK firmware programs the microcontroller as USB to I^2C/SPI bridge and supports all GUIs.

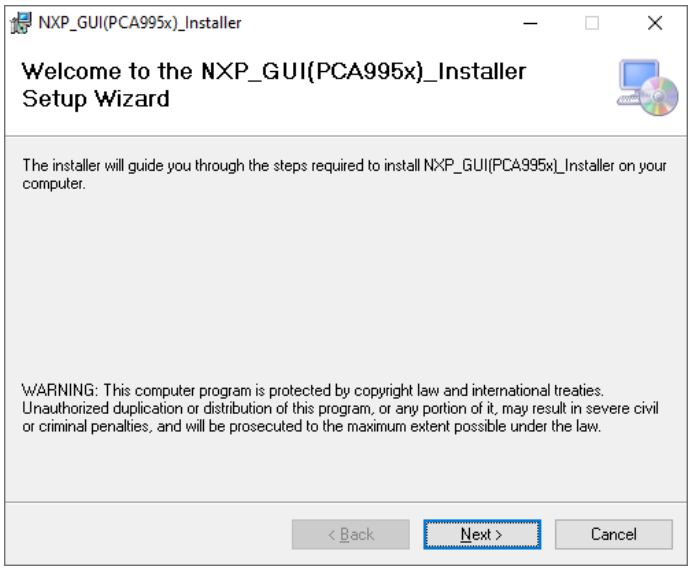
There is a separate GUI that needs to be loaded for each category of Arduino Shield (e.g., LED, Temp Sensor, Real Time Clock, etc.) and has a drop-down box to select individual devices within that category (e.g., PCA9957HN and PCA9959HN). PCA995X LED GUI is used as reference for installation.

2 GUI installation

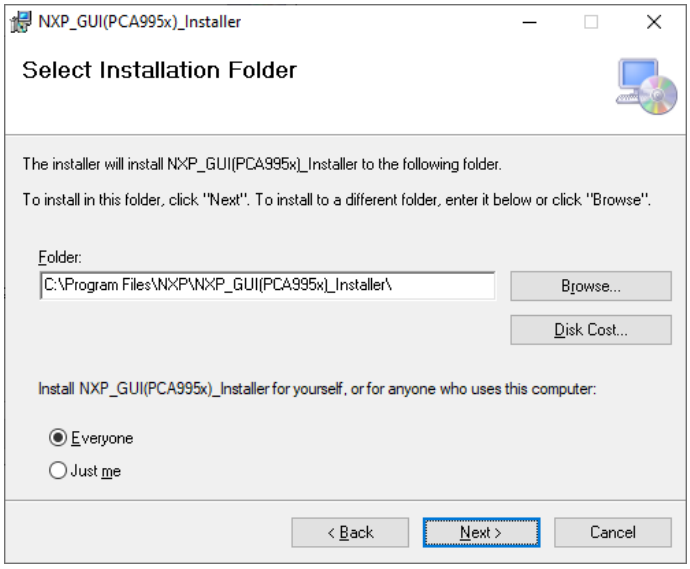
The GUI software comes in an MSI package installer.

Example: 2404200423_V1220_NXP_GUI(PCA995x).msi

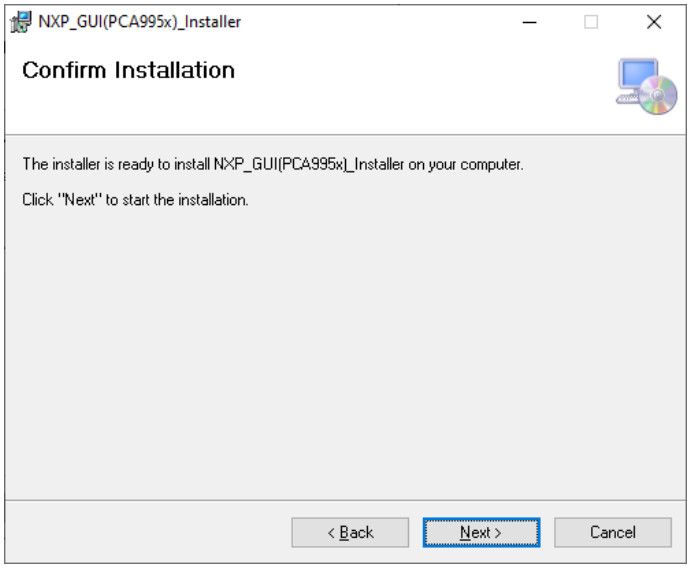
1. Launch the package to start the installation procedure.
2. Press “NEXT” to begin installation



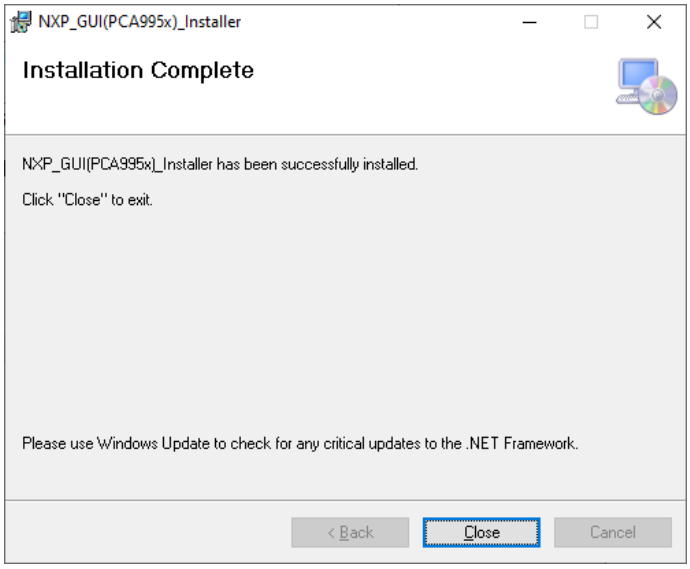
3. Select the location where the software will be installed in the next window.



4. Press “Next” to start the installation



5. Press “Close” after the installation is complete



The GUI is Installed and ready to use.

3 Firmware installation

The GUI is designed to work in conjunction with the three EVKs listed below:

- MIMXRT1050-EVK
- LPC55S69-EVK
- 8MMINILPD4-EVK

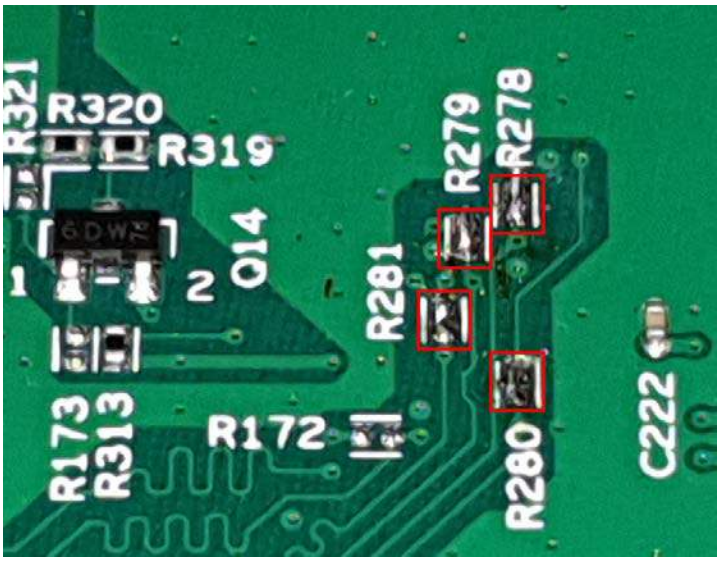
3.1 MIMXRT1050-EVK

3.1.1 Introduction

This section contains the prerequisites and the guidelines to be followed to flash a bin image to MIMXRT1050-EVK from a Windows PC.

3.1.2 Modifying the EVK

There are changes that need to be made to the EVK for this step to work. Four resistors need to be shunted to connect the SPI port: R280, R281, R270, R278.

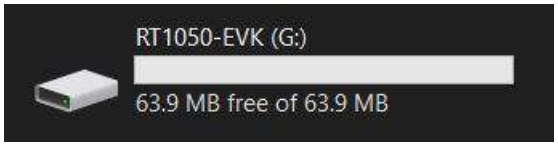


3.1.3 Flashing the firmware

The IMXRT1050_v1.0.8_3.bin image is required for this step.

The guideline for flashing .bin image to imxrt1050 from a Windows PC includes the following steps:

1. Detection of rt1050 requires “Windows serial driver” which is available in the following link. https://os.mbed.com/docs/mbed-os/v5.14/tutorials/windows-serial-driver.html
2. Connect the evk to windows PC via usb cable in j28 connector and install the driver. Here we are going to flash by OpenSDA MSD drag/drop steps.
3. Configure the power supply from the Debug USB (connect J1 5-6).
   Connect J28 OpenSDA interface with USB cable.
4. Set SW7 to OFF-OFF-OFF-ON.
5. Power on board.
6. Computer detects RT1050-EVK as removable device. Drag the generated *.bin file into RT1050-EVK



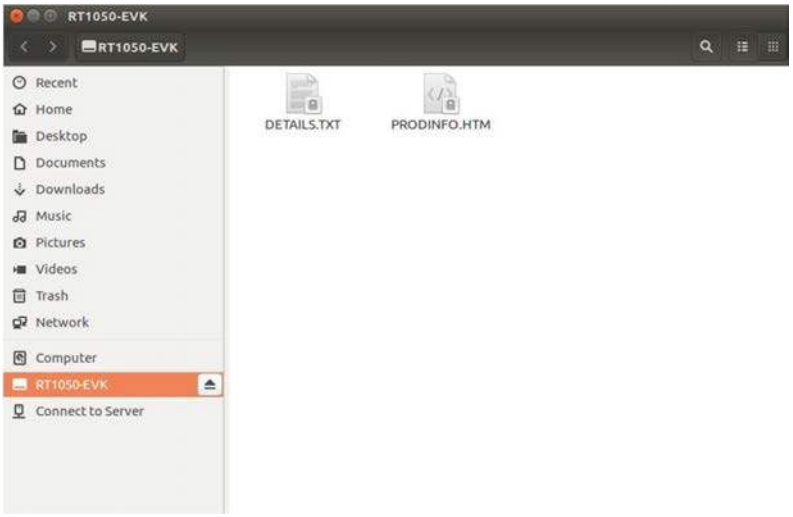
7. Power off. Set SW7 to OFF-ON-ON-OFF.
8. Power on. Push on board reset button.

Flashing .bin image from Linux PC:

The guideline for flashing .bin image to imxrt1050 from a Linux PC includes the following steps:

1. Here we are going to flash by OpenSDA MSD drag/drop steps.
2. Configure the power supply is form the Debug USB (connect J1 5-6).
3. Connect J28 OpenSDA interface with USB cable.
4. Set SW7 to OFF-OFF-OFF-ON.
5. Power on board.

6. Computer detects RT1050-EVK as removable device.



Drag the generated *.bin file into RT1050-EVK.

7. Power off. Set SW7 to OFF-ON-ON-OFF.
8. Power on. Push on board reset button.

The EVK is ready to be used with the GUI software.

3.2 LPC55S69-EVK

3.2.1 Driver installation

Download the driver from the following link and install it:

https://downloadcenter.intel.com/download

Download and install the LPCScrypt driver for windows from the following link:

https://www.nxp.com/design/microcontrollers-developer-resources/

Download and install Flash magic tool for windows from the following link:

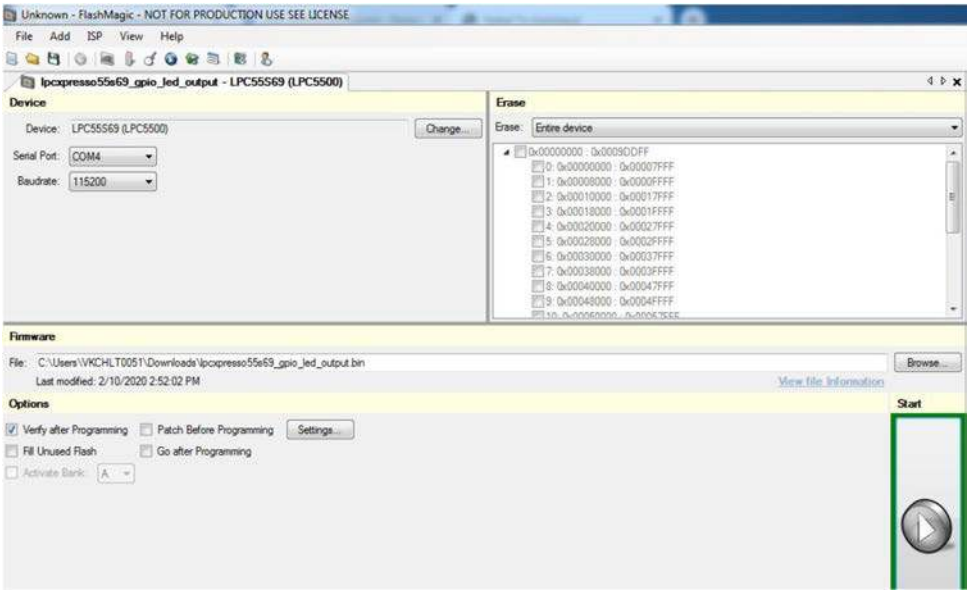
http://www.flashmagictool.com/

3.2.2 Flashing the .bin image from Windows PC

The .bin file LPC55S69_v2.0.7_3.bin is required for this step.

1. Connect the Jumper J10 to enable ISP mode in the LPC55S69.
2. Connect the LPC55S69 debug probe to the Windows PC in which flash magic is installed.
3. Copy the binary file (*.bin) into the Windows PC.

4. Open the Flash magic tool and it will contain the serial com port available. Set the baudrate (115200), device (LPC556S9) and select the .bin file from the Windows PC correctly.
   Flash the .bin using the start button.



5. Remove the debug probe, then remove J10.
6. Power up the board and press reset.

3.3 I.MX8MINI-EVK (8MMINILPD4-EVK)

3.3.1 Introduction

This section provides the complete details to work with 8MMINILPD4-EVK (hereafter referred to as ***(NXPU_ARDS)***. A Linux system or Virtual machine running Ubuntu 16.04 is required, as well as a micro SDcard of at least 8 GB capacity and an SDcard reader.

3.3.2 Preparing SD card for the NXPU_ARDS

The primary boot source for *NXPU_ARDS* EVK is an SD card. Use either prebuilt executables or build new executables to prepare SD cards. The following section describes the details to prepare SD cards either from newly compiled images (after compiling source code from the user side) or from prebuilt images.

The image fsl-image-validation-imx-imx8mmddr4evk-20200805112543.rootfs.sdcard.bz2 is required for this step.

Run the following commands in the Linux terminal:

➢ bunzip2 -dk -f
fsl-image-validation-imx-imx8mmddr4evk-<date_time>.rootfs.sdcard.bz2
➢ sudo dd
if=fsl-image-validation-imx-imx8mmddr4evk-<date_time>.rootfs.sdcard
of=/dev/sd<device_node> bs=1M conv=fsync

(***Note: replace date_and_time according to compilation time***)

device_node is the name of the node that represents the device to which image is copied. It can be sdb, sdc, mmcblk0, mmcblk1 etc. (replace date_time according to compilation time).

➢ sync

Now the SD card is ready for booting NXPU_ARDS EVK.

4 Abbreviations

Table 1. Abbreviations

Acronym	Description
GUI	Graphical User Interface
EVK	Evaluation Kit
FW	Firmware

5 Legal information

5.1 Definitions

Draft — A draft status on a document indicates that the content is still under internal review and subject to formal approval, which may result in modifications or additions. NXP Semiconductors does not give any representations or warranties as to the accuracy or completeness of information included in a draft version of a document and shall have no liability for the consequences of use of such information.

5.2 Disclaimers

Limited warranty and liability — Information in this document is believed to be accurate and reliable. However, NXP Semiconductors does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information. NXP Semiconductors takes no responsibility for the content in this document if provided by an information source outside of NXP Semiconductors. In no event shall NXP Semiconductors be liable for any indirect, incidental, punitive, special or consequential damages (including - without limitation - lost profits, lost savings, business interruption, costs related to the removal or replacement of any products or rework charges) whether or not such damages are based on tort (including negligence), warranty, breach of contract or any other legal theory. Notwithstanding any damages that customer might incur for any reason whatsoever, NXP Semiconductors' aggregate and cumulative liability towards customer for the products described herein shall be limited in accordance with the Terms and conditions of commercial sale of NXP Semiconductors.

Right to make changes — NXP Semiconductors reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Suitability for use — NXP Semiconductors products are not designed, authorized or warranted to be suitable for use in life support, life-critical or safety-critical systems or equipment, nor in applications where failure or malfunction of an NXP Semiconductors product can reasonably be expected to result in personal injury, death or severe property or environmental damage. NXP Semiconductors and its suppliers accept no liability for inclusion and/or use of NXP Semiconductors products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

Applications — Applications that are described herein for any of these products are for illustrative purposes only. NXP Semiconductors makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification. Customers are responsible for the design and operation of their applications and products using NXP Semiconductors products, and NXP Semiconductors accepts no liability for any assistance with applications or customer product design. It is customer's sole responsibility to determine whether the NXP Semiconductors product is suitable and fit for the customer's applications and products planned, as well as for the planned application and use of customer's third party customer(s). Customers should provide appropriate design and operating safeguards to minimize the risks associated with their applications and products. NXP Semiconductors does not accept any liability related to any default, damage, costs or problem which is based on any weakness or default in the customer's applications or products, or the application or use by customer's third party customer(s). Customer is responsible for doing all necessary testing for the customer's applications and products using NXP Semiconductors products in order to avoid a default of the applications and the products or of the application or use by customer's third party customer(s). NXP does not accept any liability in this respect.

Export control — This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from competent authorities.

Evaluation products — This product is provided on an "as is" and "with all faults" basis for evaluation purposes only. NXP Semiconductors, its affiliates and their suppliers expressly disclaim all warranties, whether express, implied or statutory, including but not limited to the implied warranties of non-infringement, merchantability and fitness for a particular purpose. The entire risk as to the quality, or arising out of the use or performance, of this product remains with customer. In no event shall NXP Semiconductors, its affiliates or their suppliers be liable to customer for any special, indirect, consequential, punitive or incidental damages (including without limitation damages for loss of business, business interruption, loss of use, loss of data or information, and the like) arising out the use of or inability to use the product, whether or not based on tort (including negligence), strict liability, breach of contract, breach of warranty or any other theory, even if advised of the possibility of such damages. Notwithstanding any damages that customer might incur for any reason whatsoever (including without limitation, all damages referenced above and all direct or general damages), the entire liability of NXP Semiconductors, its affiliates and their suppliers and customer's exclusive remedy for all of the foregoing shall be limited to actual damages incurred by customer based on reasonable reliance up to the greater of the amount actually paid by customer for the product or five dollars (US$5.00). The foregoing limitations, exclusions and disclaimers shall apply to the maximum extent permitted by applicable law, even if any remedy fails of its essential purpose.

Translations — A non-English (translated) version of a document is for reference only. The English version shall prevail in case of any discrepancy between the translated and English versions.

Security — Customer understands that all NXP products may be subject to unidentified or documented vulnerabilities. Customer is responsible for the design and operation of its applications and products throughout their lifecycles to reduce the effect of these vulnerabilities on customer's applications and products. Customer's responsibility also extends to other open and/or proprietary technologies supported by NXP products for use in customer's applications. NXP accepts no liability for any vulnerability. Customer should regularly check security updates from NXP and follow up appropriately. Customer shall select products with security features that best meet rules, regulations, and standards of the intended application and make the ultimate design decisions regarding its products and is solely responsible for compliance with all legal, regulatory, and security related requirements concerning its products, regardless of any information or support that may be provided by NXP. NXP has a Product Security Incident Response Team (PSIRT) (reachable at PSIRT@nxp.com) that manages the investigation, reporting, and solution release to security vulnerabilities of NXP products.

5.3 Trademarks

Notice: All referenced brands, product names, service names and trademarks are the property of their respective owners.

NXP — wordmark and logo are trademarks of NXP B.V.

Tables

Contents

For more information, please visit: http://www.nxp.com
For sales office addresses, please send an email to: salesaddresses@nxp.com

Date of release: 22 February 2021
Document identifier: UM11581