

SLN-SVUI-IOT-UG

SLN-SVUI-IOT User Guide

Rev. 1 — 16 June 2023

User guide

Document Information

Information	Content
Keywords	SLN-SVUI-IOT-UG, smart voice, IoT, smart voice user interface (SVUI), smart home
Abstract	This document describes the smart voice user interface (SVUI) solution, and its associated out-of-box features. The SLN-SVUI-IOT turnkey solution provides OEMs with a fully integrated, self-contained software and hardware solution.



1 Introduction

The MCU smart voice development kit (part number: SLN-SVUI-IOT) is a comprehensive, secure, and cost-optimized turnkey solution from NXP. The kit widely adopts its development environment that enables customers to quickly get to market with a production ready end-to-end software application.

2 Acronyms

[Table 1](#) lists the acronyms used in this document.

Table 1. Acronym

Acronym	Definition
AFE	Audio front end
ASR	Automatic speech recognition
IoT	Internet of things
JTAG	Joint test action group
MCU	Microcontroller unit
MEMS	Micro-electro-mechanical system
MSD	Mass storage device
OEM	Original equipment manufacturer
OTA	Over the air
OTW	Over the wire
PCM	Pulse-code modulation
PDM	Pulse-density modulation
PTT	Push-to-talk
ROM	Read-only memory
RTOS	Real-time operating system
SDK	Software development kit
UART	Universal asynchronous receiver-transmitter
VIT	Voice intelligent technology
DSMT	D-spotter modeling tool

3 System requirements and prerequisites

The MCU smart voice user interface (SVUI) projects require a computer running MCUXpresso IDE. It also requires a terminal program to communicate with the device via USB. [Table 2](#) describes computer configurations required for MCU SVUI projects.

Table 2. Tested computer configurations

Computer type	OS version	Serial terminal application
PC	Windows 10	Tera Term, PuTTY
Mac	macOS	Serial, CoolTerm, goSerial

Table 2. Tested computer configurations...continued

Computer type	OS version	Serial terminal application
PC	Linux	PuTTY

[Table 3](#) lists development tools using MCU local voice control SDK.

Table 3. Software tools and versions

Software tool	Version	Description
SEGGER	JLink_v7.84a or higher	Tool to program the flash
MCUXpresso IDE	Version 11.7.1 or higher	Eclipse-based IDE for development environment

4 Usage conditions

The following information is provided as per Article 10.8 of the Radio Equipment Directive 2014/53/EU:

- Frequency bands in which the equipment operates
- The maximum RF power transmitted

Table 4. Bluetooth/Wi-Fi frequency and power

Part number	RF technology	Frequency range	Max transmitted power
SLN-SVUI-IOT	Bluetooth	2402 MHz - 2483 MHz	4 dBm
	Wi-Fi	• 2.4 GHz ISM bands 2.412 GHz - 2.472 GHz • 5.15 GHz - 5.25 GHz (FCC UNII-low band) for US/ Canada and Europe • 5.25 GHz - 5.35 GHz (FCC UNII-middle band) for US/ Canada and Europe • 5.47 GHz - 5.725 GHz for Europe • 5.725 GHz - 5.825 GHz (FCC UNII-high band) for US/Canada	18.5 dBm

EUROPEAN DECLARATION OF CONFORMITY (Simplified DoC per Article 10.9 of the Radio Equipment Directive 2014/53/EU)

This apparatus, namely SLN-SVUI-IOT, conforms to the Radio Equipment Directive 2014/53/EU. The full EU Declaration of Conformity for this apparatus can be found at this location: <http://www.nxp.com/mcu-svui>.

Note:

The product is expected to lie flat on a table, microphone output pointing up.

The data mode of the USB bus is not covered by the CE certification, as this mode is used exceptionally to reprogram the device.

5 SLN-SVUI-IOT overview

SLN-SVUI-IOT embeds all the components needed to produce a secure and edge-computing voice-control product that does not require Wi-Fi or Cloud connectivity. The architecture is built upon a single-core i.MX RT1062 for the main application, powered by an Arm Cortex-M7 core.

SLN-SVUI-IOT hardware highlights:

- Up to 600 MHz (528 MHz default) Cortex-M7 MCU core
- 1 MB of on-chip RAM (512 kB TCM)
- Multiple microphone topologies:
 - Two PDM mics on main board (not active by default)
 - Two PDM mics on extension board (not active by default)
 - Three I2S mics on extension board (active by default)
- 3 W mono filter-less class-D amplifier
- Wi-Fi/Bluetooth combo chip (intended to be used for OTA updates, if needed by customers)
- Integrated speaker
- GPIO expansion headers

SLN-SVUI-IOT software highlights:

- Two-stage bootstrap and bootloader allowing flexibility in customer's implementation
- Secure boot flow with high assurance booting (HAB)
- Over-the-wire (OTW) update via UART
- Automated manufacturing/reprogramming tools
- Speech recognition engine by deep learning
- Audio front end (AFE) for far-field automatic speech recognition (ASR)

The SLN-SVUI-IOT kit is supported by a comprehensive and free-of-charge enablement suite from NXP and its partners including:

- MCUXpresso development tools
- Hardware design files
- Local voice application software source code
- Software audio tuning tools
- Documentation
- Training material

6 Getting started with MCU smart voice control

This section contains the steps for the initial board setup, describes the out-of-the-box demo applications, and how to switch between them.

6.1 Package and collateral content

[Figure 1](#) shows the SLN-SVUI-IOT kit. Ensure to check for damage or marks; if found, contact your NXP representative.



Figure 1. MCU smart voice control kit package

The SLN-SVUI-IOT kit comes with a printed quick start guide, a USB-C cable, and a Bluetooth/Wi-Fi antenna.

Note: *Wi-Fi and Bluetooth support in firmware is missing initially and is going to be added later.*



Figure 2. SLN-SVUI-IOT kit content

6.2 Initial update

To make the initial update, follow the steps below:

1. To ensure you have the latest NXP software, you must download the preconfigured "Ivaldi" zip package from <http://www.nxp.com/mcu-svui>.
2. After downloading the package, extract its contents in the C:/ directory.
Attention: Extracting archives contents in another location other than C:/ requires changes in the flashing script.
3. To make the initial update, put the board in **serial download mode** by moving jumper J61 to connect pins 2 and 3.
Attention: Do not move the jumper when the board is powered on.
4. Plug the USB Type-C connector into the SLN-SVUI-IOT kit and the USB Type-A connector into your computer.

5. Navigate to C:/Ivaldi/ and start the FLASH_SVUI_BOARD.bat script by double-clicking it. [Figure 3](#) shows the output.

```
C:\Ivaldi>cd "C:\Ivaldi\"
C:\Ivaldi>call env\Scripts\activate
Importing board_config.py from ../sln_platforms_config/sln_svui_iot_config/ folder
Establishing connection...
SUCCESS: Communication established with device.
Loading flashloader...
SUCCESS: Flashloader loaded successfully.
Jumping to flashloader entry point...
SUCCESS: Device jumped to execute flashloader.
Waiting for device to be ready for blhost...
get-property
SUCCESS: Device is ready for blhost!
Reading device unique ID...
get-property
SUCCESS: Device serial number is HUK3YdchPhI=
SUCCESS: Device thing name is HUK3YdchPhI
Writing memory config option block...
fill-memory
SUCCESS: Config option block loaded into RAM.
Configuring FlexSPI...
configure-memory
SUCCESS: FlexSPI configured.
Erasing flash...
flash-erase-all
SUCCESS: Flash erased.
Programming bootstrap...
write-memory
SUCCESS: Bootstrap written to flash.
Programming bootloader...
write-memory
SUCCESS: Bootloader written to flash.
Programming file-system at address... 0x61600000
write-memory
SUCCESS: Programmed flash with file-system for this "thing".
Programming Application Bank A...
write-memory
SUCCESS: Application Bank A written to flash.
Programming Application Bank B...
write-memory
SUCCESS: Application Bank B written to flash.
read-memory
SUCCESS: Application entry point at 0x60002451
read-memory
SUCCESS: Application entry point at 0x20208000
Attempting to execute application...
execute
SUCCESS: Application running.
```

Figure 3. Initial update output

6. When the update is done, disconnect the board, move the jumper to the initial position (connecting pins 1 and 2), and reboot the board.

6.3 Power on

Plug the USB Type-C connector into the SLN-SVUI-IOT kit and the USB Type-A connector into your computer. [Figure 4](#) shows how to connect the kit using a USB cable.



Figure 4. Connecting the SLN-SVUI-IOT Kit to the computer using a USB cable

When you power on the kit for the first time, the LED blinks green light. Then, prompts you to ask for a demo selection. The available demos are:

- Elevator
- Smart home
- Washing machine

After making the selection (by saying one of the demo names), a confirmation tone plays, saying, "Okay, elevator/smart home/washing machine demo". If you do not say any demo name until the timeout period expires (by default, 8 seconds), the default demo, smart home, is selected automatically.

The board boots automatically into demo application #1. For details, see [Section 6.4](#).

6.4 Out-of-the-box demo applications

Two types of SLN-SVUI-IOT out-of-the-box demo applications are included:

- Demo application #1: smart home (IoT)/elevator/washing machine voice control - **VIT**-based:
 - Language: selectable (English by default, can be switched to Chinese, French, or German)
- Demo application #2: smart home (IoT)/elevator/washing machine voice control - **DSMT**-based:
 - Language: multilingual (supports English, Chinese, French, and German in parallel)

6.4.1 Demo application #1: smart home (IoT)/elevator/washing machine voice control - VIT-based

After powering on and making your demo selection, as described in [Section 6.3](#), the SLN-SVUI-IOT kit is up and running and waiting for voice commands. Start by saying the wake word "Hey, NXP". The board responds by

playing a confirmation sound and turns the LED blue while waiting for a voice command. Depending on what demo you chose at the boot time, the commands for English are:

- For smart home (IoT):
 - Turn on the lights
 - Turn off the lights
 - Temperature higher
 - Temperature lower
 - Open the window
 - Close the window
 - Make it brighter
 - Make it darker
- For elevator:
 - First floor
 - Second floor
 - Third floor
 - Fourth floor
 - Fifth floor
 - Main lobby
 - Ground floor
 - Basement floor
 - Open door
 - Close door
- For washing machine:
 - Delicate
 - Normal
 - Heavy duty
 - Whites
 - Start
 - Cancel

If the kit detects your voice command, it changes the LED color, and plays a confirmation prompt. If the kit does not detect any of the commands within a period, the device turns the LED purple and plays a chime to indicate that the waiting time has ended. By default, the response waiting time is 8 seconds, but you can change the value with the shell command "timeout N", where N is the time value in milliseconds.

You can always change between smart home (IoT), elevator, and washing machine demo by saying the wake word "Hey, NXP!", followed by the "change demo" voice command. Again, a prompt asks for a demo selection. Also, you can switch between demos by pressing the SW2 (see [Figure 9](#)) button on the board.

Smart home (IoT)/elevator/washing machine voice control - VIT-based supports four languages: English, Chinese, French, and German. English is selected by default, but you can change it by saying the wake word "Hey, NXP!", followed by the "change language" command. Then, a voice prompt asks for a language selection. [Table 5](#) shows the whole set of instructions for Chinese, French, and German.

Another way to change the language and the active demo is by using a shell command. For details, see [Section 6.4.2](#).

Table 5. Voice commands

Chinese	French	German
Wake word: 你好, 恩智浦	Wake word: Salut, NXP	Wake word: Hallo, NXP
Smart home (IoT) commands:	Smart home (IoT) commands:	Smart home (IoT) commands:

Table 5. Voice commands...continued

Chinese	French	German
打开灯 关闭灯 升高温度 降低温度 打开窗帘 关闭窗帘 亮一点 暗一点	Allumer lumière Éteindre lumière Augmenter température Diminuer température Ouvrir fenêtre Fermer fenêtre Augmenter luminosité Diminuer luminosité	Licht einschalten Licht ausschalten Temperatur erhöhen Temperatur verringern Fenster hoch Fenster runter Heller Dunkler
Elevator commands: 到一楼 到二楼 到三楼 到四楼 到五楼 大堂 负一楼 地下室 开门 关门	Elevator commands: Premier étage Deuxième étage Troisième étage Quatrième étage Cinquième étage Entrée principale Rez-de-chaussée Sous-sol Ouvrir porte Fermer porte	Elevator commands: Erste etage Zweite etage Dritte etage Vierte etage Fünfte etage Hauptlobby Erdgeschoss Untergeschoss Öffne die tür Schließe die tür
Washing machine commands: 精致模式 正常模式 强力模式 洗白模式 开始 取消	Washing machine commands: Lavage délicat Lavage normal Lavage en profondeur Lavage blanc Commencer Annuler	Washing machine commands: Feinwäsche Normaler Stark verschmutzte Weiß Starten Abbrechen
Change demo command: 选择应用	Change demo command: Changer de démo	Change demo command: Anwendung wechseln
Change language command: 选拉语吕	Change language command: Changer de langue	Change language command: Sprache wechseln

6.4.2 Connecting to a serial terminal

The out-of-the-box demos in the [Section 6.4.3](#) and [Section 6.4.4](#) require a connection to a serial terminal in order to display the detected wake words and commands.

To open a SHELL terminal, follow the steps below:

1. Connect a serial terminal application to the USB serial device interface that enumerates (115200-8-N-1), as shown in [Figure 5](#).

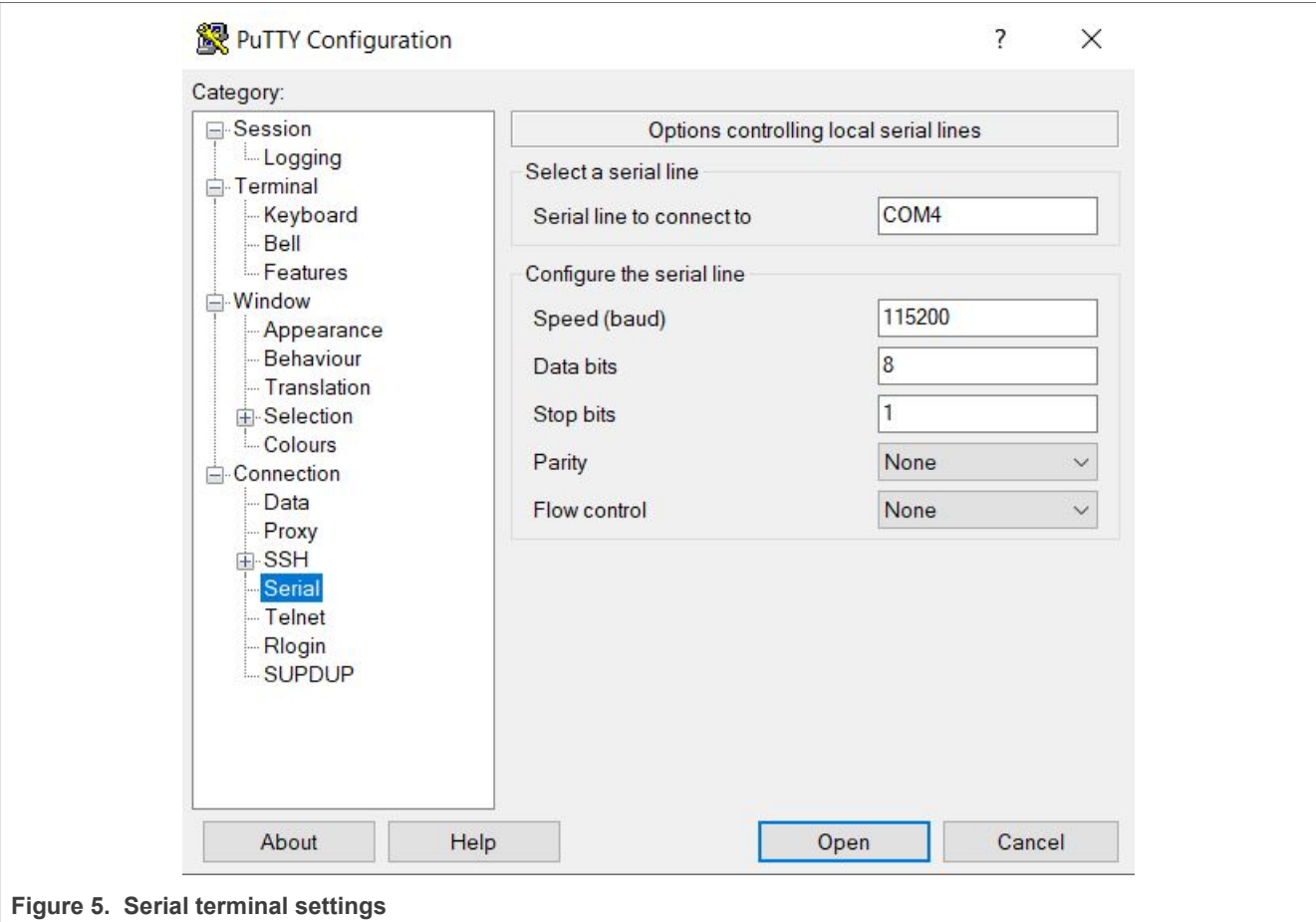


Figure 5. Serial terminal settings

- 2. Press Enter on the keyboard. The `SHELL>>` prompt appears.
- 3. Type `help` to show the available commands at the shell with a description of each.
- 4. Type `commands` to ensure which demo is set in selected languages. [Figure 6](#) indicates that the current demo is set to the smart home demo.

```
SHELL>> commands
Language: en
Wake Word: Hey NXP
Commands:
  Turn on the lights
  Turn off the lights
  Temperature higher
  Temperature lower
  Open the window
  Close the window
  Make it brighter
  Make it darker
  Change demo
  Change language
  Elevator
  Washing Machine
  Smart Home
  English
  French
  German
  Chinese

SHELL>> █
```

Figure 6. Commands for demo application #1: Smart home (IoT)/elevator/washing machine voice control - VIT-based

The language and the active demo can be changed using shell commands. [Figure 7](#) and [Figure 8](#) show the usage of `changelang` and `changedemo`, respectively.

```
"changelang": Change language(s). Save in flash memory.
  Usage:
    changelang language_code
    when called without parameters, it will display the current active language(s)
  Parameters
    only one of the following languages: cn de en fr
```

Figure 7. Language selection command

```
"changedemo": Change the command set. Save in flash memory.
  Usage:
    changedemo <param>
  Parameters
    one of the following demos: elevator wash smart
```

Figure 8. Demo selection command

6.4.3 Switching to demo application #2

To switch to the second application demo, hold SW3 and press SW1. [Figure 9](#) shows how the buttons are placed. The board is reset and automatically boots into the second application. Then, a voice prompt asks for a demo selection (smart home (IoT), elevator, or washing machine). After choosing it, a prompt confirms your selection and confirms that you switched to the multilingual demo (Demo application #2 - DSMT-based).

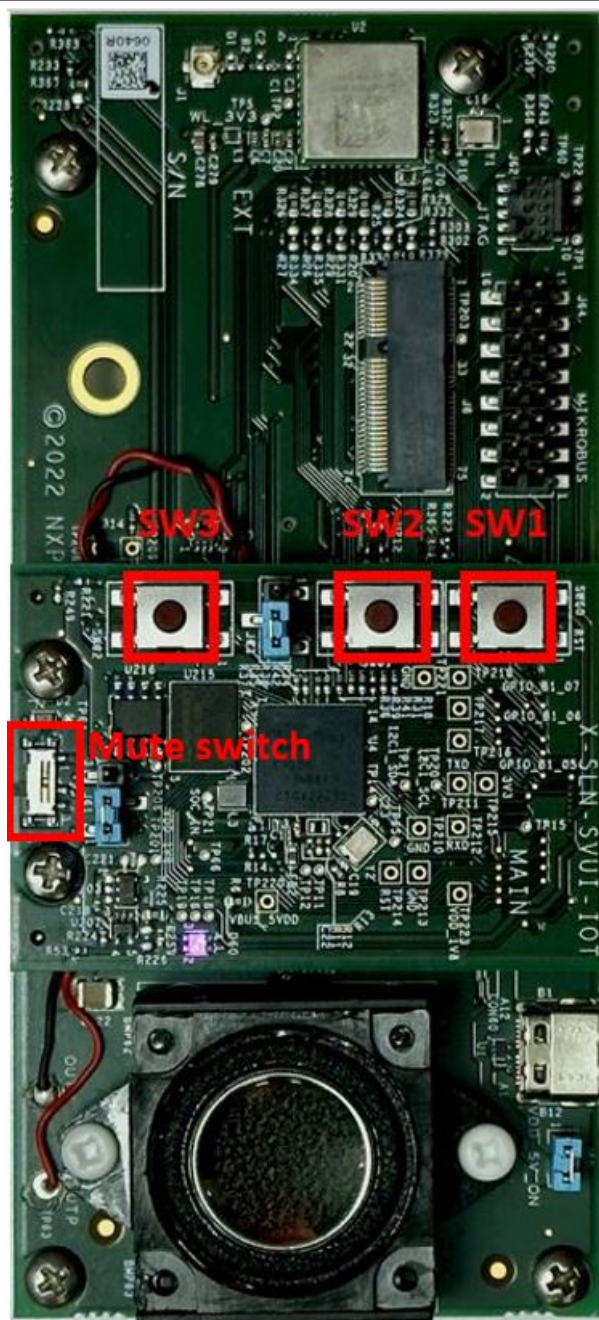


Figure 9. Buttons placement on board

6.4.4 Demo application #2: smart home (IoT)/elevator/washing machine voice control - DSMT-based

The DSMT-based application has the same three demos as the VIT-based one. The main difference is that the DSMT application supports multiple languages in parallel. By default, the board listens for the wake word only in English. It can be easily configured to listen in any combination of the four languages supported (English, Chinese, French, and German) using the `changelang` command, followed by the list of languages you want to enable.

To enable all languages in parallel, type `changelang en cn fr de` in shell and hit Enter. The wake words are listed below:

- Hey, NXP (English)
- 你好, 恩智浦 (Chinese)
- Salut, NXP (French)
- Hallo, NXP (German)

If a wake word triggers the SLN-SVUI-IOT kit, the LED turns blue, and the board starts listening for commands in the selected language based on the wake word. Depending on your demo selection, you can use the commands listed in [Section 6.4.1](#). You can always check available commands using shell by typing "commands", as shown in [Figure 10](#).

```
SHELL>> commands
Available commands in selected languages:

Language: en
Wake Word: Hey NXP
Commands:
  Delicate
  Normal
  Heavy duty
  Whites
  Start
  Cancel
  Change demo

Language: cn
Wake Word: 你好, 恩智浦
Commands:
  精致模式
  正常模式
  强力模式
  洗白模式
  开始
  取消
  选择应用

Language: de
Wake Word: Hallo NXP
Commands:
  Feinwäsche
  Normaler
  Stark verschmutze
  Weiß
  Starten
  Abbrechen
  Anwendung wechseln

Language: fr
Wake Word: Salut NXP
Commands:
  Lavage délicat
  Lavage normal
  Lavage en profondeur
  Lavage blanc
  Commencer
  Annuler
  Changer de démo

SHELL>> █
```

Figure 10. Display available commands

However, the DSMT-based demo application allows you to select any combination of these four different languages. To enable your preferred language, enter `changelang` command in the shell followed by

the languages you want to enable. For example, if you want to enable German and French, then enter `changelang de fr` where 'de' and 'fr' are the language codes of German and French, respectively. You can also enable one language only. To enable one language, type `changelang` followed by the `<language_code>` you want to enable. [Figure 11](#) shows the examples. All the language selection is saved in flash memory and retained even after the kit is rebooted.

```
SHELL>> changelang en cn
Enabling en cn language(s).
SHELL>> Updated Shell command parameter in flash memory.

SHELL>> changelang de fr
Enabling de fr language(s).
SHELL>> Updated Shell command parameter in flash memory.
```

Figure 11. Examples of selecting multiple languages

Type commands to ensure that the current demo is set in selected languages. [Figure 12](#) shows the commands of the washing machine in the selected two languages.

```
SHELL>> commands
Available commands in selected languages:

Language: de
Wake Word: Hallo NXP
Commands:
  Feinwäsche
  Normaler
  Stark verschmutze
  Weiß
  Starten
  Abbrechen
  Anwendung wechseln

Language: fr
Wake Word: Salut NXP
Commands:
  Lavage délicat
  Lavage normal
  Lavage en profondeur
  Lavage blanc
  Commencer
  Annuler
  Changer de démo

SHELL>> █
```

Figure 12. Checking available commands after language selection

7 Controlling the device

The SLN-SVUI-IOT can be controlled using voice commands or shell commands. The board provides feedback via LED for all actions, as well as audio feedback for detected voice commands.

7.1 Physical control description

[Table 6](#) describes the LED color behavior to help you understand what state the SLN-SVUI-IOT kit is in.

Table 6. Summary of LED color and behavior

Function	LED State	Color	Description
Boot up	Green blink		The device has powered on and is going through initialization.
Wake word detected	Solid Blue		The device has detected the wake word and is listening to a command.
Command detected	Green blink 200 ms	 	The device has detected a command.
Change demo flow	Solid Orange		The device is waiting for a demo selection.
Change language flow	Solid Yellow		The device is waiting for a language selection.
Timeout	Purple blink 200 ms	 	If no command is detected within a certain time, the device stops listening to a command.
Microphone off	Solid Orange		Microphones are turned off.
Push-to-talk (PTT) mode	Solid Cyan		The device is on PTT mode. By pressing SW1, wake word detection phase is bypassed and the device listens to a command.
Initialization failed	Solid Red		The device failed to initialize AFE or ASR.

Table 6. Summary of LED color and behavior...continued

Function	LED State	Color	Description
Audio stream error	Solid Purple		Audio stream after AFE is not transferred to ASR.
ASR memory error	Solid Orange		During initialization or language or demo change, an error occurred in verifying memory pool size.
DSMT limit reached	Solid Purple		The board reached the 100 command detections DSMT evaluation library limit.
AFE time limit reached	Solid Red		The board reached the 25 hours AFE evaluation library limit.

7.2 Shell command interface

The SLN-SVUI-IOT comes with a shell command interface that allows you to communicate and control the board using specific commands.

7.2.1 Switching out-of-the-box demo applications

Shell commands `changedemo`, `commands`, and `changelang` are responsible for switching between demos and selecting demo languages. For more information and examples, see [Section 6.4](#).

7.2.2 Controlling volume

You can control the speaker volume by entering "volume N" where N is an integer value ranging from 0 (mute) to 100 (max). The default volume is 55. [Figure 13](#) shows an example of changing the speaker volume to 30.

```
SHELL>> volume 30
Setting speaker volume to 30.
SHELL>> Updated Shell command parameter in flash memory.
```

Figure 13. Setting speaker volume to 30

7.2.3 Muting the microphones

You can mute or unmute your microphones by entering "mute on/off". When muted, the LED glows in solid Orange. [Figure 14](#) shows the result of mute on/off commands.

```
SHELL>> mute on
Setting mute on.
SHELL>> Updated Shell command parameter in flash memory.

SHELL>> mute off
Setting mute off.
SHELL>> Updated Shell command parameter in flash memory.
```

Figure 14. Setting speaker volume to 30

The microphones can also be muted physically by sliding the switch (see [Figure 9](#)) from the side of the main board to the left. The LED next to the switch turns red, confirming that the microphones are muted.

7.2.4 Setting the timeout

You can set the command waiting time by entering "timeout N" where N is milliseconds. [Figure 15](#) shows an example of setting the command waiting time to 7 seconds. The default timeout is 8 seconds. Say the voice command before the waiting time ends.

```
SHELL>> timeout 7000
Setting command waiting time to 7000 ms.
SHELL>> Updated Shell command parameter in flash memory.
```

Figure 15. Setting the waiting time to 7 seconds

7.2.5 Enabling the follow-up mode

With the follow-up mode enabled, you can continue saying multiple commands after triggering the kit by the wake word. [Figure 16](#) shows an example of the wake word and commands – Hey, NXP, First floor, Second floor, and Basement floor. Notice that the wake word is said only once, followed by three voice commands. After the last command, the ASR session ends, if no additional command follows during the waiting time.

```
SHELL>> followup on
Setting ASR Follow-Up mode on.
SHELL>> Updated Shell command parameter in flash memory.

[ASR] Session started
[ASR] Wake Word: Hey NXP ^4(4) - MapID(1)
[ASR] Command: First floor(0) - MapID(3)
[ASR] Command: Second floor ^1(2) - MapID(3)
[ASR] Command: Basement floor(9) - MapID(3)
[ASR] Timed out waiting for response
[ASR] Session ended

SHELL>> followup off
Setting ASR Follow-Up mode off.
SHELL>> Updated Shell command parameter in flash memory.
```

Figure 16. Follow-up mode use case

7.2.6 Enabling the push-to-talk mode

The push-to-talk PTT mode allows you to bypass the wake word detection phase. Enter `ptt on` to enable the ptt mode and `ptt off` to disable it. The Cyan LED color indicates that the kit is in PTT mode. During PTT mode, press SW3 (see [Figure 9](#)) to skip the wake word and continue saying a voice command.

```
SHELL>>
SHELL>> ptt on
Setting ASR Push-To-Talk mode on. English only activated.
SHELL>> Updated Shell command parameter in flash memory.

SHELL>> ptt off
Setting ASR Push-To-Talk mode off.
SHELL>> Updated Shell command parameter in flash memory.
█
```

Figure 17. Example of PTT usage

7.2.7 Checking the software version

The command **version** prints the firmware version and the current bank either Bank A or Bank B.

[Figure 18](#) shows the result of the version command when the application is at Bank A.

```
SHELL>> version
SHELL>> Firmware version: 1.0.2, Current Bank: BankA
SHELL>> █
```

Figure 18. Check the software version

7.2.8 USB mass storage device mode

In the flash memory of the SLN-SVUI-IOT kit, the three main things stored are: two applications (stored in specific banks, called Bank A and Bank B) and the filesystem.

- Address for application Bank A: 0x60200000
- Address for application Bank B: 0x60C00000
- Address for filesystem: 0x61600000

For more information on generating an application binary or generating a new filesystem binary, refer to the *SLN-SVUI-IOT User Manual* (document [SLN-SVUI-IOT-UM](#)).

USB mass storage device (MSD) allows you to reflash the main application binary or the filesystem without a J-Link probe.

By default, the MSD feature skips signature verification to facilitate a smoother development flow. Signing images can be time-consuming and not ideal for quick debugging and validation.

Attention: *Bypassing image verification is a security hole and it is the responsibility of the product maker to remove the violation in production.*

To put the device into MSD mode, hold down switch 2 (SW2), and power cycle the board until the pink LED lights up. The pink LED turns on and off in 3 seconds interval.

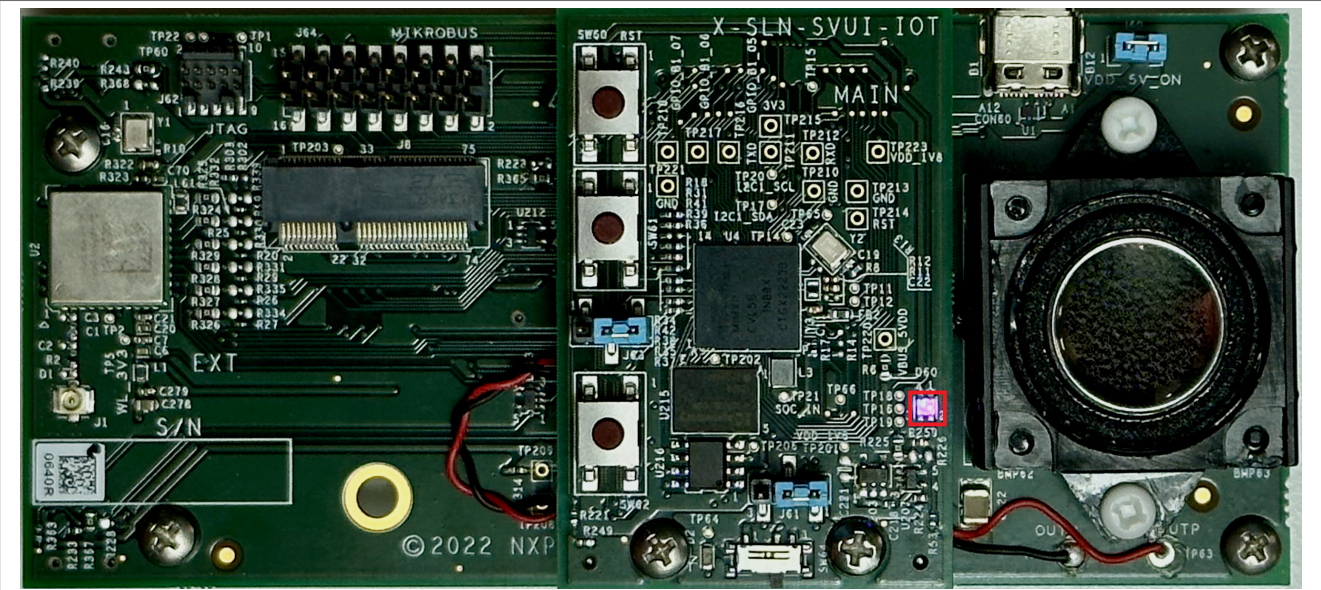


Figure 19. MSD update mode LED

Navigate to the file explorer and confirm that the SLN-SVUI-IOT kit is mounted as a USB mass storage drive. A mounted kit is displayed on the file explorer as shown [Figure 20](#).

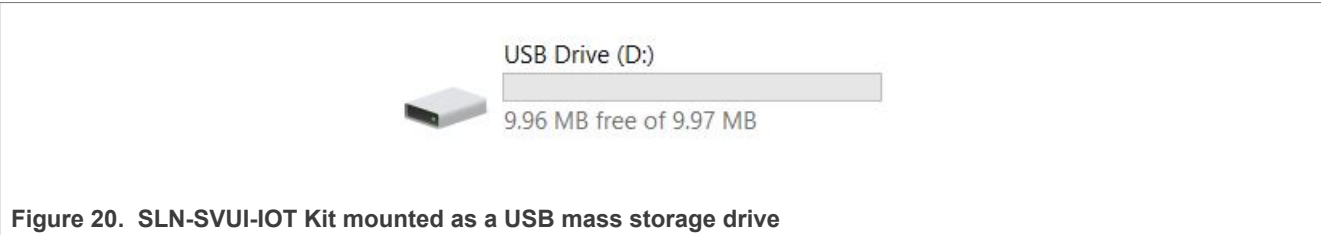


Figure 20. SLN-SVUI-IOT Kit mounted as a USB mass storage drive

When updating only one application bank, you can drag and drop the generated *.bin file onto the MSD drive. The download process and writes the *.bin file to flash. After the image is programmed into flash, it begins execution.

Note: The binary is placed on a bank other than the one the kit currently runs on.

Since the i.MX RT1060 flash remap feature is enabled, the binary no longer needs to be compiled for a specific bank. To update the filesystem, after generating the binary, rename it to LFS.bin and then drag and drop it onto the MSD drive.

MSD allows you to update both banks and/or the filesystem. To update both banks with only one MSD, you must generate two *.bin files, and then make sure to rename them to APP_A.bin and APP_B.bin. This way, the board determines at what address to flash each binary. If you want to update the filesystem as well, add the LFS.bin into the MSD drive.

Note: When updating more than one bank using MSD, the binaries used MUST have the following names: APP_A.bin, APP_B.bin, and/or LFS.bin

8 Product specifications

[Table 7](#) lists various specifications of SLN-SVUI-IOT.

Table 7. Product specifications

Description	Specification
Electrical rating	DC supply via USB type-C connector, 5.0 V +/-10 %, 2 A
Temperature rating	10 °C to 40 °C
Wireless standards	Wi-Fi 2.4 GHz and 5 GHz band (IEEE 802.11 a/b/g/n), Bluetooth 5.2
Radio frequency range	2400 MHz - 2483.5 MHz, 5.15 GHz - 5.825 GHz

9 References

The following references are available to supplement this document:

- *SLN-SVUI-IOT-UM User Manual* (document [SLN-SVUI-IOT-UM](#))
- Hardware files (Gerbers, schematics, BOM)

10 Revision history

[Table 8](#) summarizes the revisions to this document.

Table 8. Revision table

Revision number	Date	Substantive changes
1	16 June 2023	Initial release

11 Legal information

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