
STSW-WPSTUDIO user guide

Introduction

The purpose of this document is to provide a comprehensive user guide to the [STSW-WPSTUDIO](#) software and aims to give clear instructions on how to install, execute, and use the available features.

This document is intended for end users of the [STSW-WPSTUDIO](#) software who have all the required hardware setup configuration.

The scope of this document is limited to the [STSW-WPSTUDIO](#) software.

1 Abbreviations, acronyms, and definitions

1.1 Abbreviation and acronyms

Table 1. List of abbreviations

Abbreviation	Description
I2C	Inter-integrated circuit
HW	Hardware
NVM	Non-volatile memory
PRx	Power receiver
PTx	Power transmitter
Rx	Receiver/Receive. Unless explicitly mentioned, this is used interchangeably with PRx
Tx	Transmitter/Transmit. Unless explicitly mentioned, this is used interchangeably with PTx
UI	User interface

1.2 Definitions

Table 2. List of definitions

Name	Description
Application processor	A microcontroller or microprocessor that controls the device of interest. Typically, an application processor is the main processor of the system or subsystem in which the device is connected to.
Customer	The person, or persons, who pay for the product and usually (but not necessarily) decide the requirements. In the context of this recommended practice the customer and the supplier may be members of the same organization.
Host	A master system that controls the device of interest. In the case that the host is a microcontroller or microprocessor, it is referred as an application processor.
User	The person, or persons, who operate or interact directly with the product.

2 System requirements

Table 3. List of system requirements

Description	Minimum requirement
Operating system	Microsoft® Windows® 10
Processor	1GHz processor
RAM	1GBytes or higher (minimum 4GB preferred for better performance)
Hard disk space	15Mbytes or more

3 Software installation

STSW-WPSTUDIO software does not require specific installation steps. To execute the software:

1. Extract the contents of STSW-WPSTUDIO Vx.x.x.zip into C driver.
2. STSW_WPSTUDIO supports both GUI and Command Line Mode execution.

Choose one of the below installation steps based on the mode needed.

- Double click on STSW-WPSTUDIO Vx.x.x.exe to launch the software in GUI Mode. This is the recommended user mode with full functionality.
- Execute STSW-WPSTUDIO Vx.x.x.exe with valid input parameters from the command line to launch the Command Line Interface version. This mode only supports programming the devices.

Table 4. Inputs

Inputs Arguments	Description	Options
STSW-WPSTUDIO Vx.x.x.exe	Tool executable Name	NIL
fw	Firmware programming	NIL
-d	Device Type	WLC38 / WLC98 / WLC99 / WBC86
-p	Patch memh file name with correct path	"patch.memh"
-c	Config memh file name with correct path	"config.memh"
-o	Log file name to be saved	"log.txt"

The example below shows how to program the WLC38 RX device with patch and config files using the command line.

```
"STSW-WPSTUDIO Vx.x.x.exe" fw -d WLC38 -p "patch.memh" -c "config.memh" -o "log.txt"
```

4 Hardware connection

Before starting the software, ensure that the target evaluation kit is connected to the PC via a USB converter. [Table 5](#) shows a list of USB-I2C dongles supported by the [STSW-WPSTUDIO](#) software.

The [STSW-WPSTUDIO](#) can connect a maximum of two USB-I2C converters to allow PTx and PRx to be evaluated simultaneously. [Table 6](#) lists the WLC evaluation kits supported by the [STSW-WPSTUDIO](#) software.

Figure 1. STSW-WPSTUDIO hardware connection

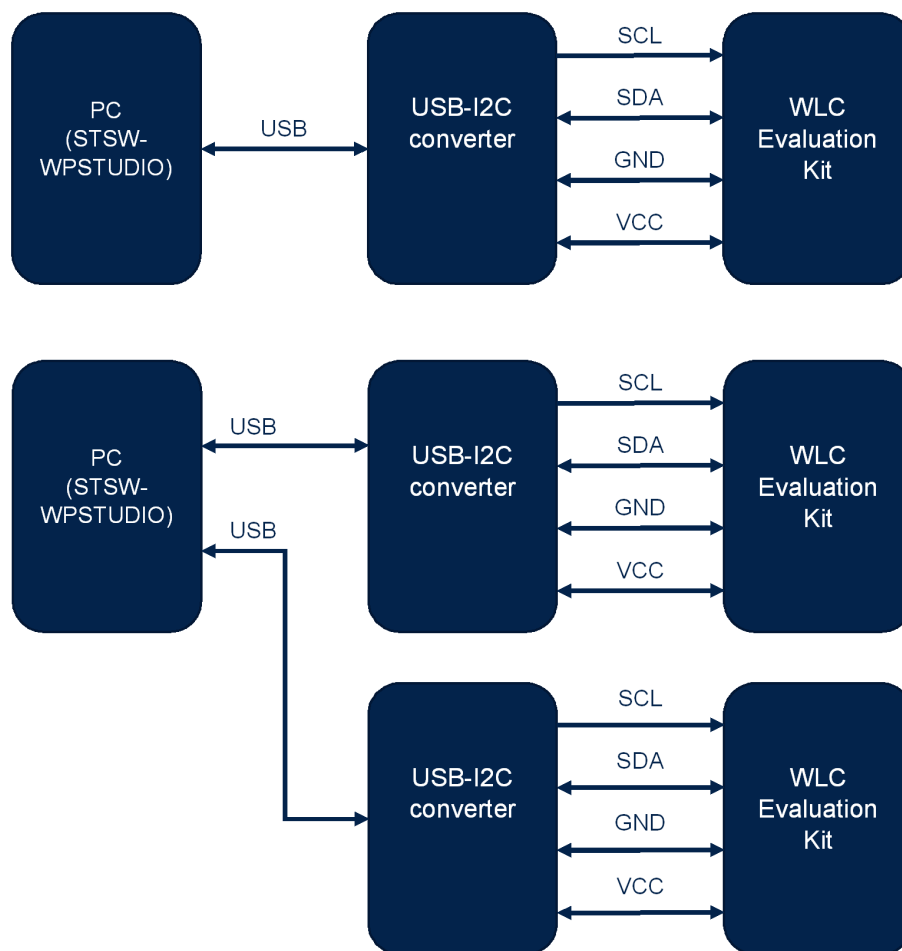


Table 5. List of supported USB-I2C converters

Part number	Description
STEVAL-USBI2CFT	Generic low-cost USB-I2C convertor

Table 6. List of supported WLC evaluation kits

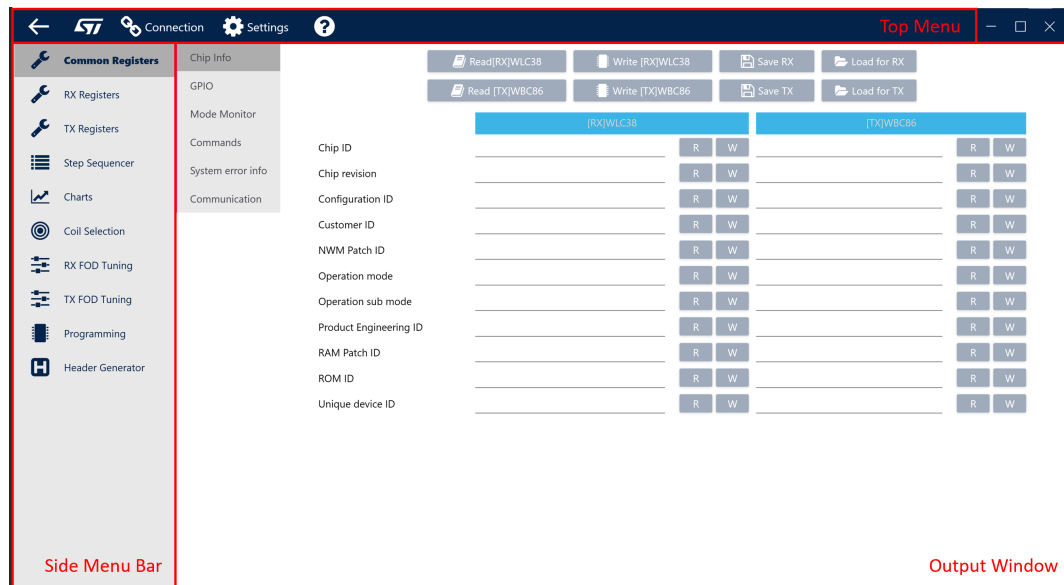
Part number	PRx/PTx	Description
STEVAL-WBC86TX	PTx	5W PTx for general application (USB-I2C convertor is part of evaluation kit)
STEVAL-WLC98RX	PRx	Up to 50W application
STEVAL-WLC38RX	PRx	5W / 15W PRx for general application (USB-I2C convertor is part of evaluation kit)
STEVAL-WLC99RX	PRx	Up to 70W application

5 Interface description

The **STSW-WPSTUDIO** main interface consists of three main sections – Top menu, Side Menu Bar, and the Output Window.

The Side Menu Bar selects the output in the Output Window. It is not discussed in detail in this document. Please refer to [Section 6 Top menu section](#).

Figure 2. STSW-WPSTUDIO main interface



6 Top menu section

The top menu section hosts the interface to access to the software's setup, settings, and information about the software.

Figure 3. Top menu section



Table 7. Top menu UI element(s) description

UI element(s)	Description
Expander	Allows the user to expand and collapse the Side Menu bar. This feature allows the user to have a bigger view of the Output window when needed
Connection	Opens the Connection window. This window allows the user to set up connection to the WLC devices (via USB-I2C connection USB-I2C converter)
Settings	The Settings button opens the Settings window
About	Opens the About window

6.1 Connection window

Figure 4. Connection window

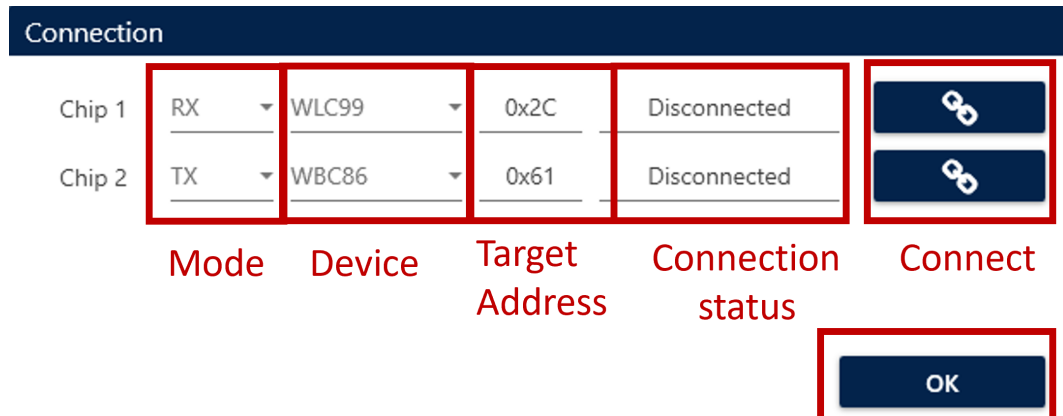


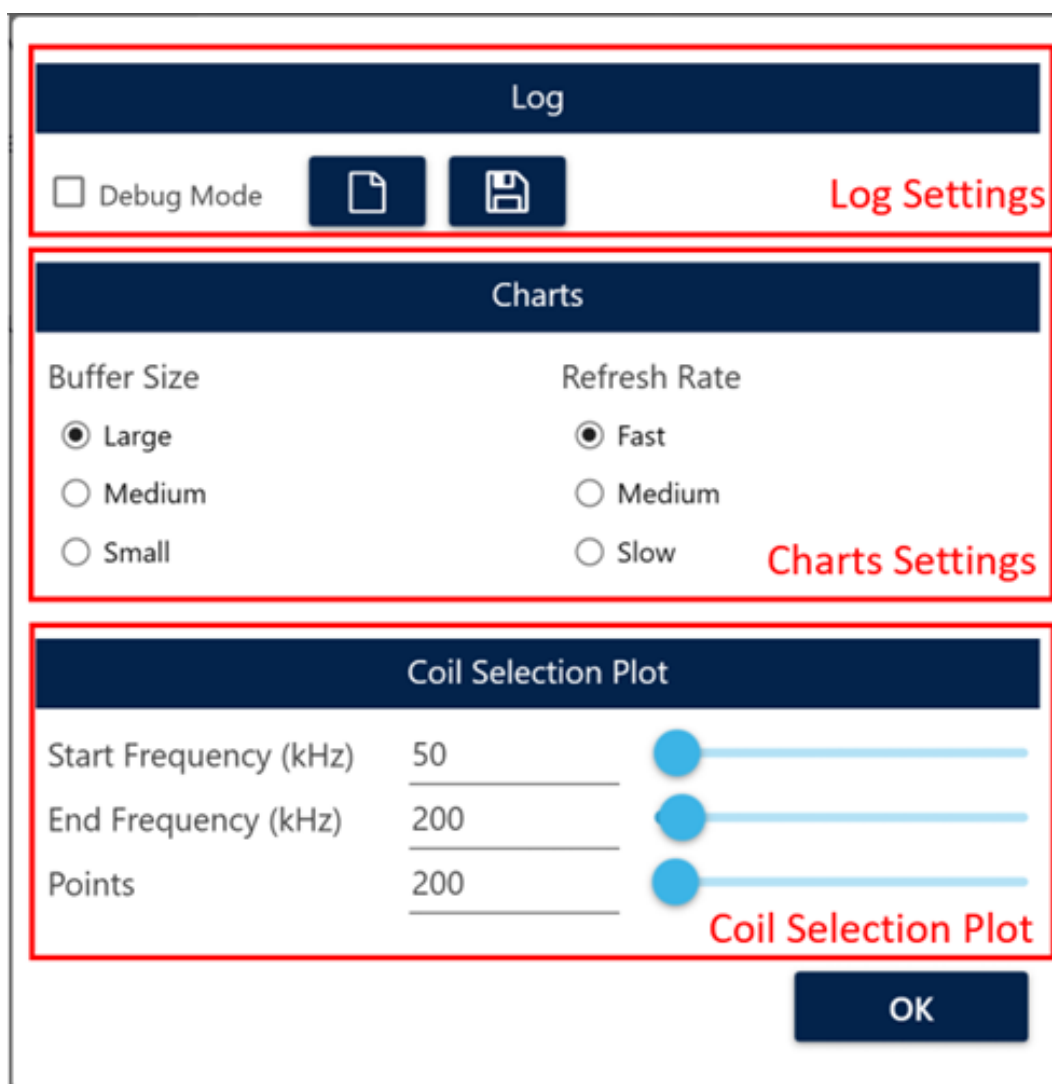


Table 8. Connection window UI element(s) description

UI element(s)	Description
Mode	Selects the device operation mode (Empty/RX/TX). Note that only one Rx and one Tx can be selected simultaneously. Choose Empty if device is not configured.
Device	Selects the target WLC device.
Connection status	Shows current connection status to target WLC device.
Target Address	Target address for device, allows user to input custom address.
Connect	<p>Check to connect/disconnect to target WLC device.</p> <div>  Disconnected, click to connect </div> <div>  Connected, click to disconnect </div>

6.2 Settings window

Figure 5. Settings window


The Settings window is divided into three main sections, each highlighted with a red border:

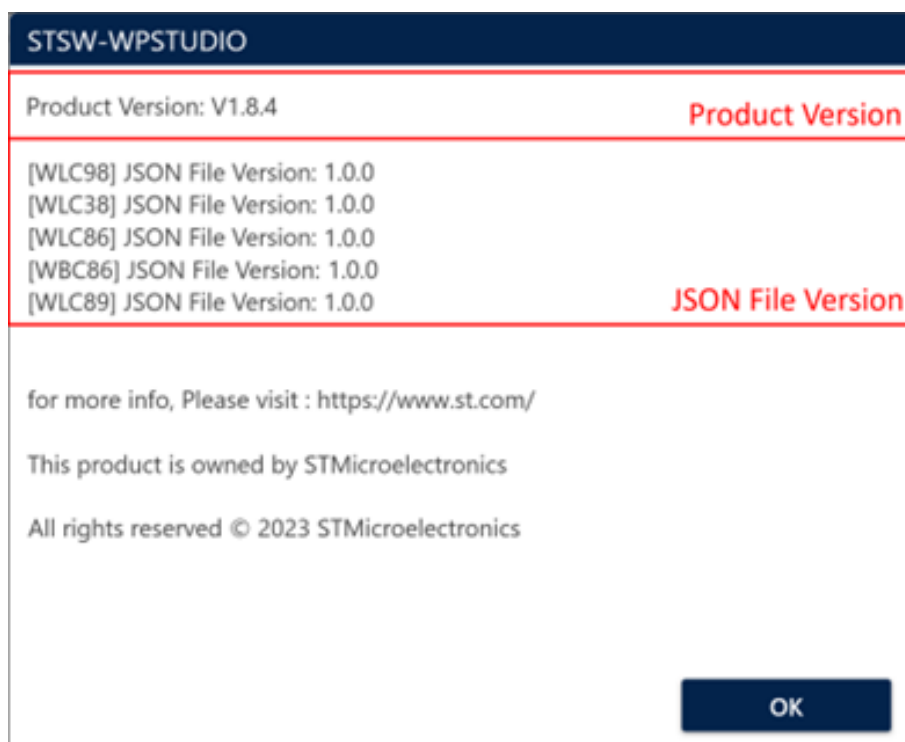
- Log Section:** Contains a "Log" header, a "Debug Mode" checkbox, two file icons (document and floppy disk), and a "Log Settings" label.
- Charts Section:** Contains a "Charts" header, "Buffer Size" settings (Large, Medium, Small radio buttons), "Refresh Rate" settings (Fast, Medium, Slow radio buttons), and a "Charts Settings" label.
- Coil Selection Plot Section:** Contains a "Coil Selection Plot" header, input fields for "Start Frequency (kHz)" (50), "End Frequency (kHz)" (200), and "Points" (200), three horizontal sliders, and a "Coil Selection Plot" label.

An "OK" button is located at the bottom right of the window.

Table 9. Settings window UI element(s) description

UI element(s)	Description
Log settings	Enable log level to debug Option to Clear log and save current log as encrypted .txt file
Charts settings	Configures chart plotting features Buffer size [large: 100MB, medium: 50Mb, small: 10Mb] Refresh rate of plots [fast: 10Hz, medium: 5Hz, slow: 1Hz]
Coil selection plot	Configures starting, ending, and resolution for coil sweeping frequency

6.3 About window

Figure 6. About window

Table 10. About window UI element(s) description

UI element(s)	Description
Product version	Software version number
JSON file version	JSON project file version number(s)

7 Output window

7.1 Common registers, Rx registers and Tx registers

The Common registers, Rx registers and Tx registers window allow the user to read from and write to the target WLC registers. It allows the user to read/write to a single/all register and save/load these values to/from a configuration file.

Figure 7. Common register window

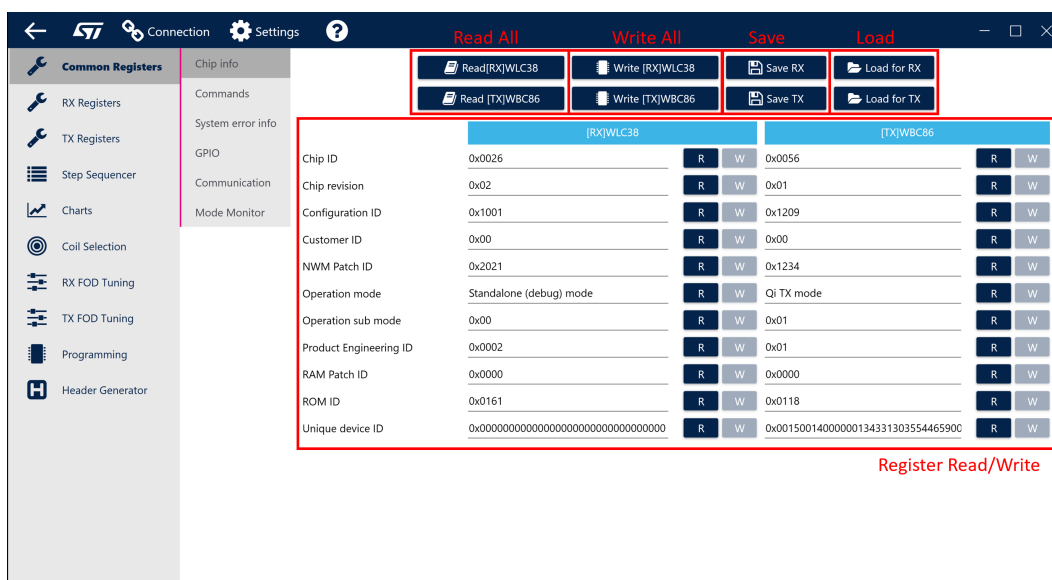


Table 11. Common register window UI element(s) description

UI element(s)	Description
Read all	Reads from all the registers and updates the register read/write area
Write all	Writes to all the registers and updates the register read/write area. Data from registers updated to chip. Note that registers in "red" cannot be updated to chip this way; it has to be saved as an memh file and flashed
Save	Saves the register settings into a configuration file
Load	Loads a configuration file. Note that this only loads the data to the UI. To load to the device, use the write all button
Register read/write	Read/write to individual register using button "R"/"W". Note that the write button is disabled if the register is read-only. Note that registers in "red" cannot be updated to chip this way; it only updates the read/write area

7.2 Step sequencer

The step sequencer allows the user to configure and perform a single or a series of step sequences. A step sequence may be an I²C transaction (for example, writing to a generic address, I²C register, or hardware register), or a wait.

In addition, a series of step sequences can be grouped and saved into a Quick Access button. This allows the user to quickly repeat a series of step sequences without having to execute them one-by-one.

Figure 8. Step sequencer window

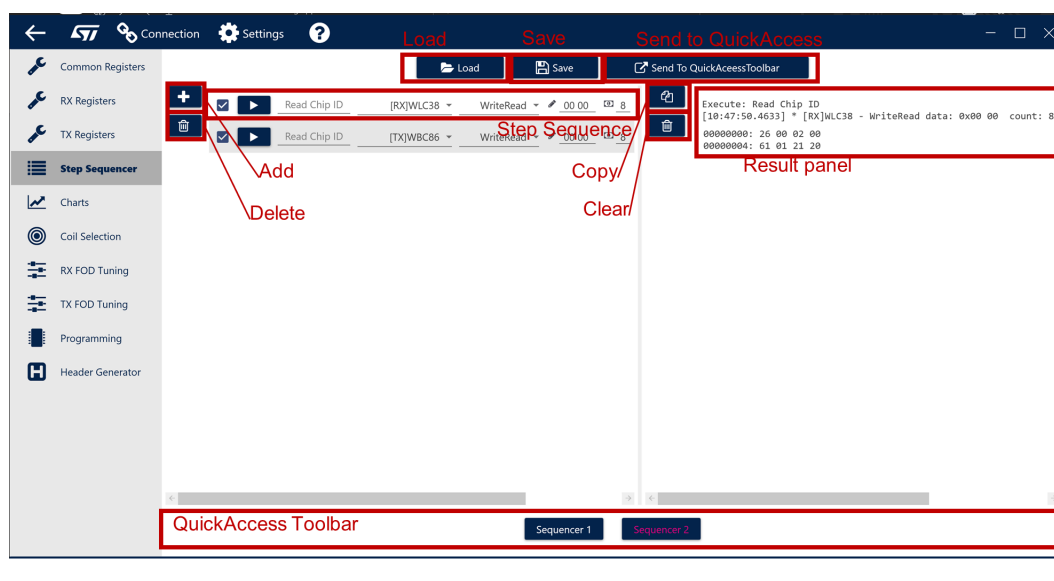


Table 12. Step sequencer window UI element(s) description

UI element(s)	Description
Load	Loads previously saved step sequence(s) from a file
Save	Saved current step sequence(s) into a file
Send to QuickAccess	Stores selected step sequence(s) into a new button in the QuickAccess toolbar
Add	Adds a new step sequence
Delete	Deletes all step sequences
Step sequence	Setup sequence configuration
Result panel	Displays the execution result of a step sequence
Copy	Copies the result panel into clipboard
Clear	Clears the result panel
QuickAccess toolbar	Stores custom Quick Access button(s) that contains saved step sequence(s)

7.3 Charts

Charts allow the user to sample and plot the data read from the chip in real time. Chart settings are configurable in the *Settings Window*.

Charts for both PRx and PTx devices are grouped together and made available for user selection in column for groups like “Voltage”, “Current”, etc. A maximum four groups of charts can be displayed at a time.

Figure 9. Charts window

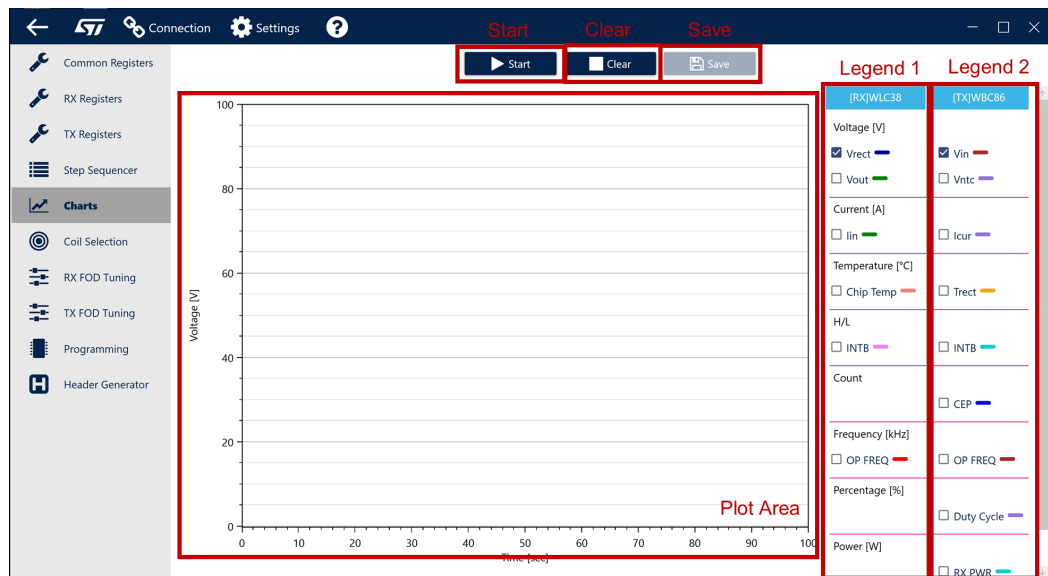


Table 13. Charts window UI element(s) description

UI element(s)	Description
Start	Starts sampling and plotting
Clear	Clears existing plot(s)
Save	Saves current plot into .csv file
Plot area	Shows one or multiple plots
Legend 1/2	Legend for plot area. Click on tick box to enable/disable plotting

Table 14. Charts controller description

Action	Gesture
Pan	Right mouse button
Zoom	Mouse wheel
Zoom by rectangle	Ctrl+Right mouse button, middle mouse button
Reset	Ctrl+Right mouse button double-click, middle mouse button double-click
Show 'tracker'	Left mouse button
Reset axes	'A', Home
Copy code	Ctrl+Alt+C
Copy properties	Ctrl+Alt+R

7.4 Coil selection, Rx FOD tuning, Tx FOD tuning

Details about coil selection and FOD tuning is separately available in the respective application notes and user manual.

7.5 Programming

The programming window is used to program the patch and configuration file(s) into the NVM of the target device. This window accepts two different file formats - .memh, which is a text based hexadecimal value, or a .h header file.

Figure 10. Programming window

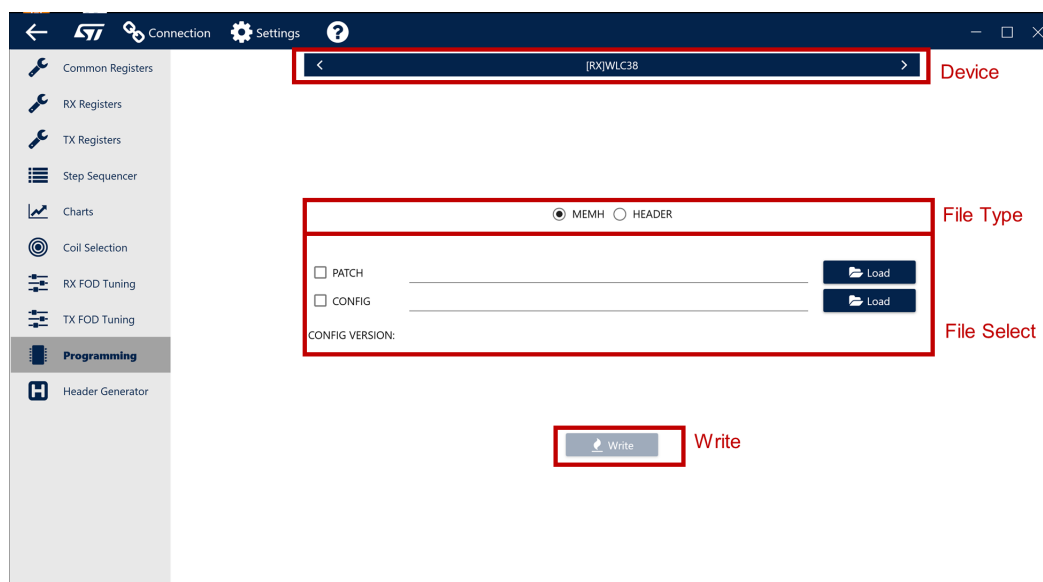


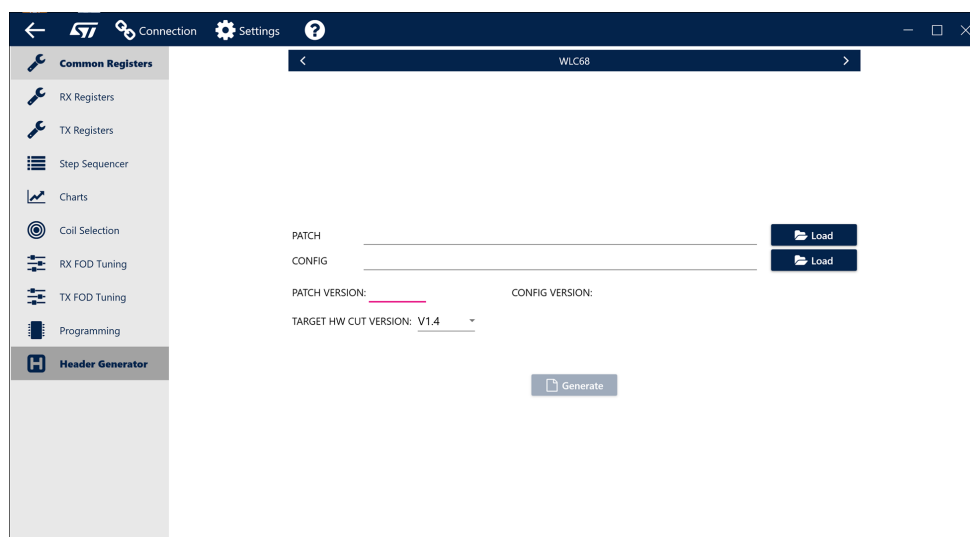
Table 15. Programming window UI element(s) description

UI element(s)	Description
Device	Selects the target WLC device to be programmed.
File type	Selects the source file type (memh or .h file).
File select	Selects the file. Tick the checkbox to enable the programming.
Write	Starts the programming sequence.

7.6 Header generator

The header generator window converts the patch and configuration file into a .h file that contains the C definition of the patch and configuration. This .h may be used to develop the host driver (such as a Linux kernel driver).

Figure 11. Header generator window



8 STSW-WPSTUDIO release summary

Table 16. Release summary

Type	Summary
Feature updates	<ul style="list-style-type: none"> NVM Header File Generator, format changed. Connection Window, Receiver address option added. NVM Programming added sanity check. Added Command Line Mode for tool execution.
Bug fixes	<ul style="list-style-type: none"> Registers - configs "Write All". Coil selection - the calculation of recommended TX coil inductance. In Register Json parsing, Register Read/Write from Device.

Revision history

Table 17. Document revision history

Date	Revision	Changes
18-Jul-2023	1	Initial release.
28-Feb-2024	2	Updated Section 3 Software installation , Section 6.1 Connection window and Section 6.2 Settings window . Added Section 8 STSW-WPSTUDIO release summary .

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