Scan Engine Configuration Guide

For Smartscanner SC9^{EX1} with Scan Engine version 34 Type 17-S19C-..... Draft/January 2025

Technical data subject to change without notice. Changes, errors and misprints may not be used as a basis for any claim for damages.

Table of Contents

About This Guide

Read carefully before commissioning the device.
This document is auxiliary to the available Quick Start Guide and part of the device. This guide is directed at all persons who are entrusted with handling the device.

Read carefully before commissioning the device.
Knowledge of the safety instructions and warnings in this guide and strict compliance with them is essential for safe handling. • Carefully read these documents and especially the safety instructions herein before using the device. • Make these documents accessible to all people who are entrusted with handling the device.

Reference Documents

This manual leverages information from, but not limited to:

- Zebra barcode symbology reference guides (see Zebra FAQ)
- Standardized barcode format references, such as TEC-IT's.
- The product Quick Start Guide included with SC9EX1.

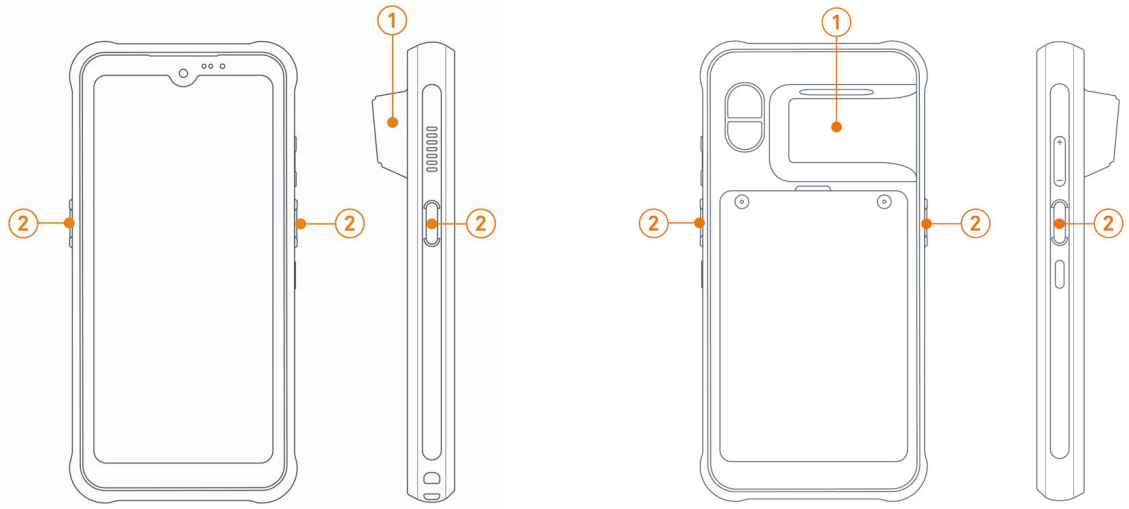
About the Hardware

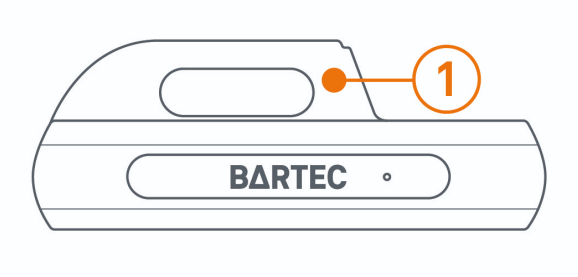
The SC9^{EX1} device integrates advanced scanning technology based on the Zebra® SE5500 Scan Engine (SE) for efficient and accurate scanning.

- 1D/2D Advanced Range Scan Engine with IntelliFocus™ technology.
- reading range up to 12.2 m (480.3 in) depending on type, size and quality of the barcode.

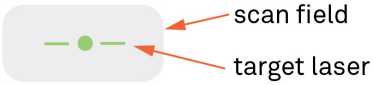
All supported symbologies/barcode types are listed in the product datasheet on the BARTEC homepage.

1	Scan Engine SE5500	2	Left/right trigger buttons (orange)





1. To start scanning, ensure that the application intended to receive scan results is open in the foreground and the appropriate text field is in focus (text cursor is in the text field).
2. Point the top of the Device in the direction of the barcode.
3. Press and hold one of the programmable buttons on either side to start the scanning process. A green dash-dot-dash target laser will be activated to help you aim.



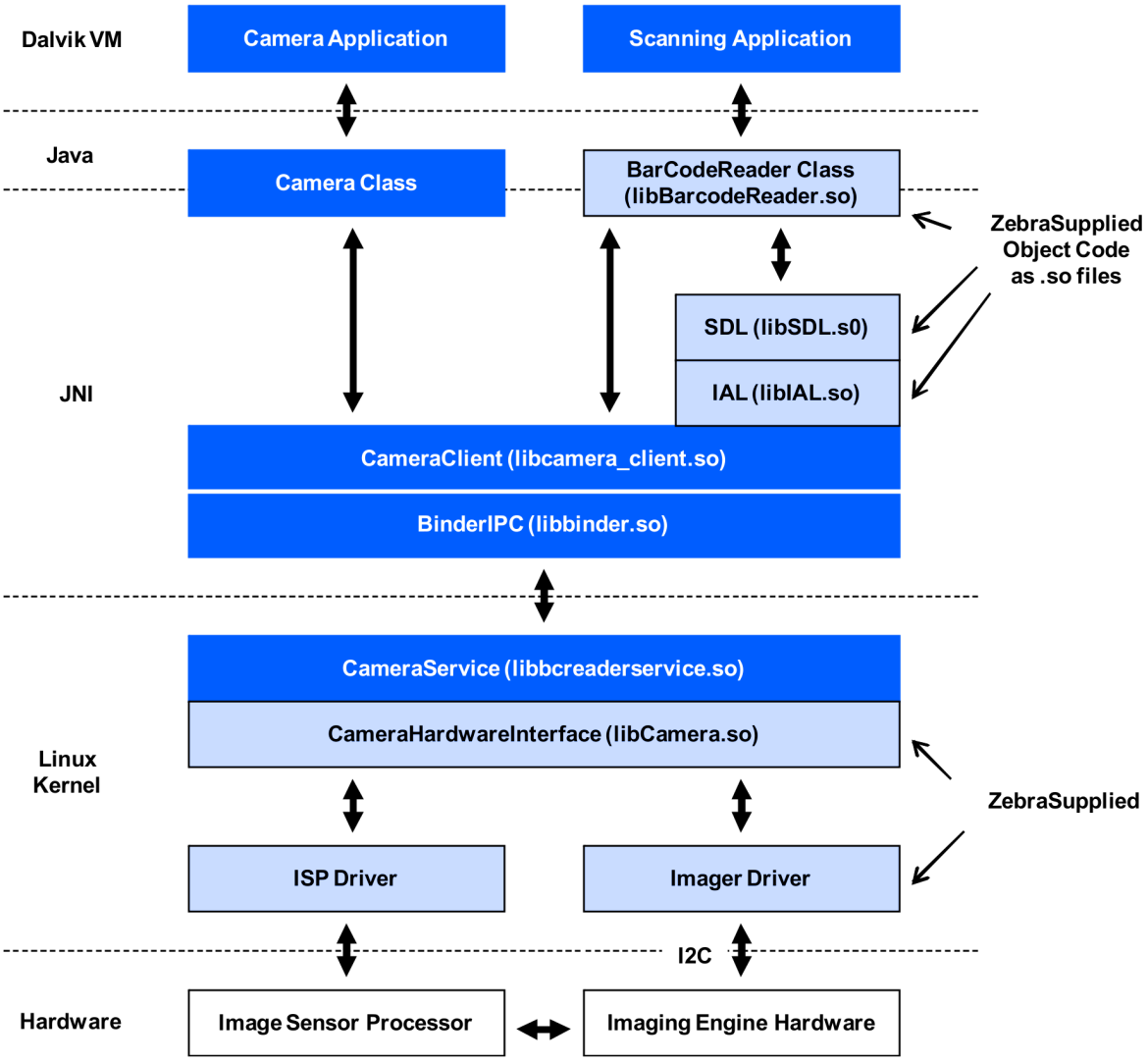
4. Make sure that the barcode is within the illuminated scan field.

5. Upon successful barcode decoding, several feedback options are available. A short beep is enabled by default but haptic (vibration) feedback is also available in the Scan Engine control app, under each profile settings.

Software (SW) Preamble

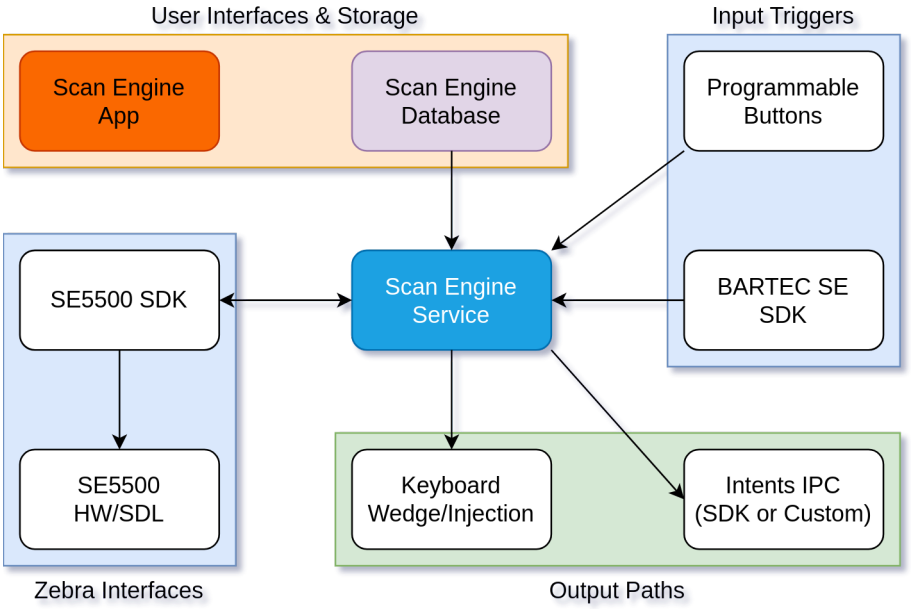
Scan Engine SW Components

Our Scan Engine stack contain several components that work in tandem to modulate the operation of the SE5500 hardware. Depicted bellow are the lower level interfaces used by our software.



Most notable, our scanning package is split into:

1. The Scan Engine service, a background process which reacts to various scan triggers, and applies the appropriate configuration to each scan event.
2. The Scan Engine app launcher, which presents the user interface (UI) where all the hardware parameters, and additional BARTEC features can be controlled.



The Scan Engine App

The app is the user-visible part of the Scan Engine package pre-installed on the device and allows the configuration of the scanning process and related functions, such as:

Scan Engine

Create customized scanning profiles

- Choose the output path and the format of barcode results
- Assign/link foreground apps to specific profiles
- Fully configure the Zebra SE5500 input parameters
- Export and import profile data as JSON serialized data

EMM/MDM Integration

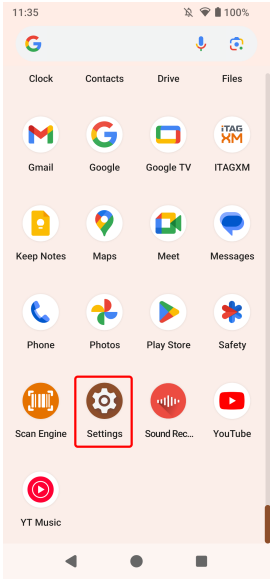
On curent builds, the user visible icon is simply a shell launcher for the main UI activity in `com.bartec.scanengine`, equivalent to the shortcut entry under the **Settings > Scan Engine**. This **Settings** applet is always visible upon provisioning, but the shell launcher icon might not be present if not whitelisted in the Enterprise profile.

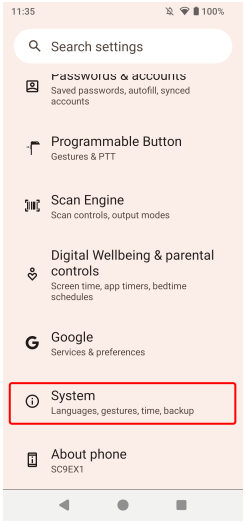
To ensure that the Scan Engine icon is also present, the stub `com.bartec.shortcuts` package should also be whitelisted in the Work profile.

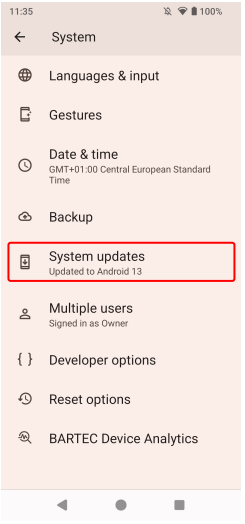
SW Package Updates

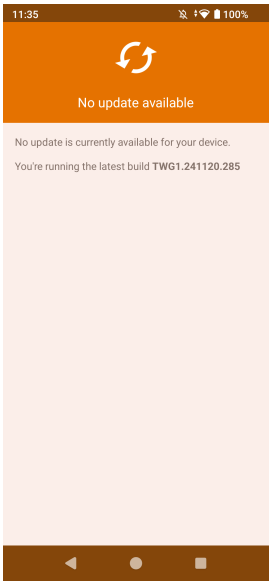
Updates are pushed/rolled out over-the-air (OTA), via our software (SW) update infrastructure, thus an Internet connection is required. The Scan Engine SW package is not available publicly on Google Play Store.

If SE updates are not installed automatically, you may trigger for them manually from **Settings > System > System updates**.









Software Development Kit (SDK)

A separate SDK is available for more advanced software integration and can be downloaded from the BARTEC support page (https://support.pixavi.com/en/support/home).

Via this SDK, basic scan functions and corresponding barcode result collection can be controlled programmatically.

The BARTEC Scan Engine SDK provides an Intent-based interface for Android applications. The interface allows apps to interact with the Scan Engine system service by using defined Intent actions and extras. Key functionalities include opening and releasing connections, triggering scanning actions, and receiving the scanned data.

Scan Engine User Interface (UI)

Scanner Profiles

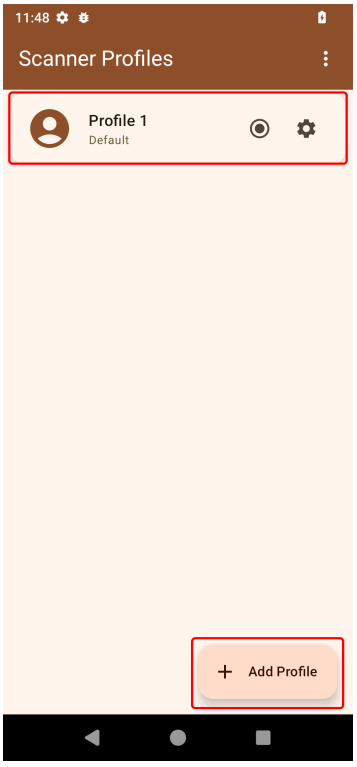
Profiles are an important concept in our Scan Engine stack. They allow bundling a set of input/output parameters, to customize the behavior of the SE5500 hardware and result format.

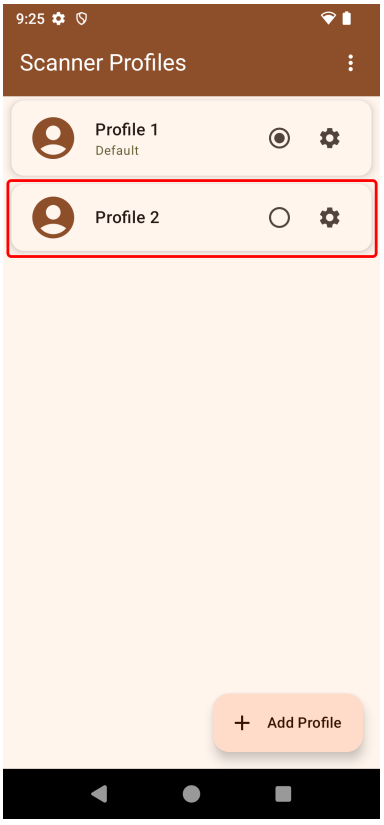
Normally, whichever profile is marked as default here is used for the current scanning event, unless the **Assigned Applications** feature is used. If all profiles are deleted for some reason, the default parameter set is used, which is equivalent to running with an unmodified profile.

The initial **Profile 1** is generated upon the first start of the app, or after app storage clean-up, then it is marked as default.

Each new profile added with the **Add Profile** function is initialized with our default set of parameters for the SE5500 hardware, which largely match the Zebra SDK default values.

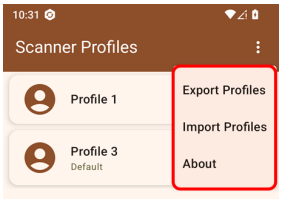
Each profile can be customized in numerous ways, as described in the following sections. The round radio button toggles the default profile selection.





Overflow/Dot Menu

The top right overflow menu allows access to a few general functions:

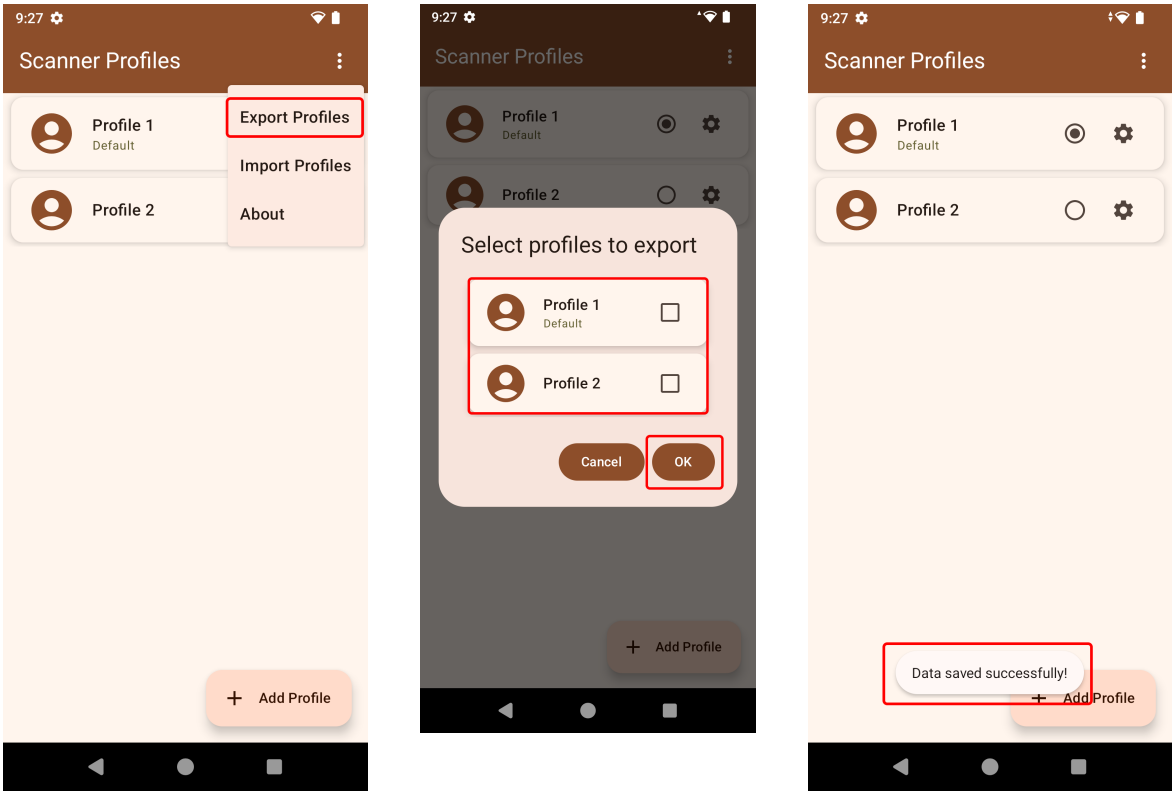


- **Export Profiles**: save one or more profiles to a JSON (serialized text) file.
- **Import Profiles**: trigger a JSON file import, replacing all existing profiles.
- **About**: show information about the Scan Engine package and the current version.

Export Profiles

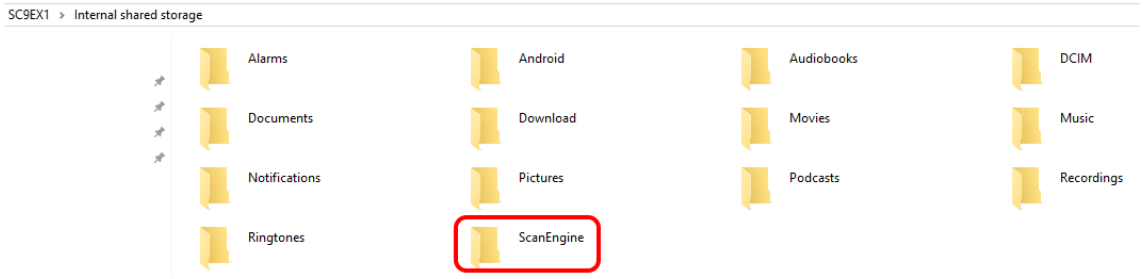
One or multiple profiles can be selected for JSON file export using this feature.

Open **Scan Engine > Overflow/3-Dot Menu > Export Profiles**.

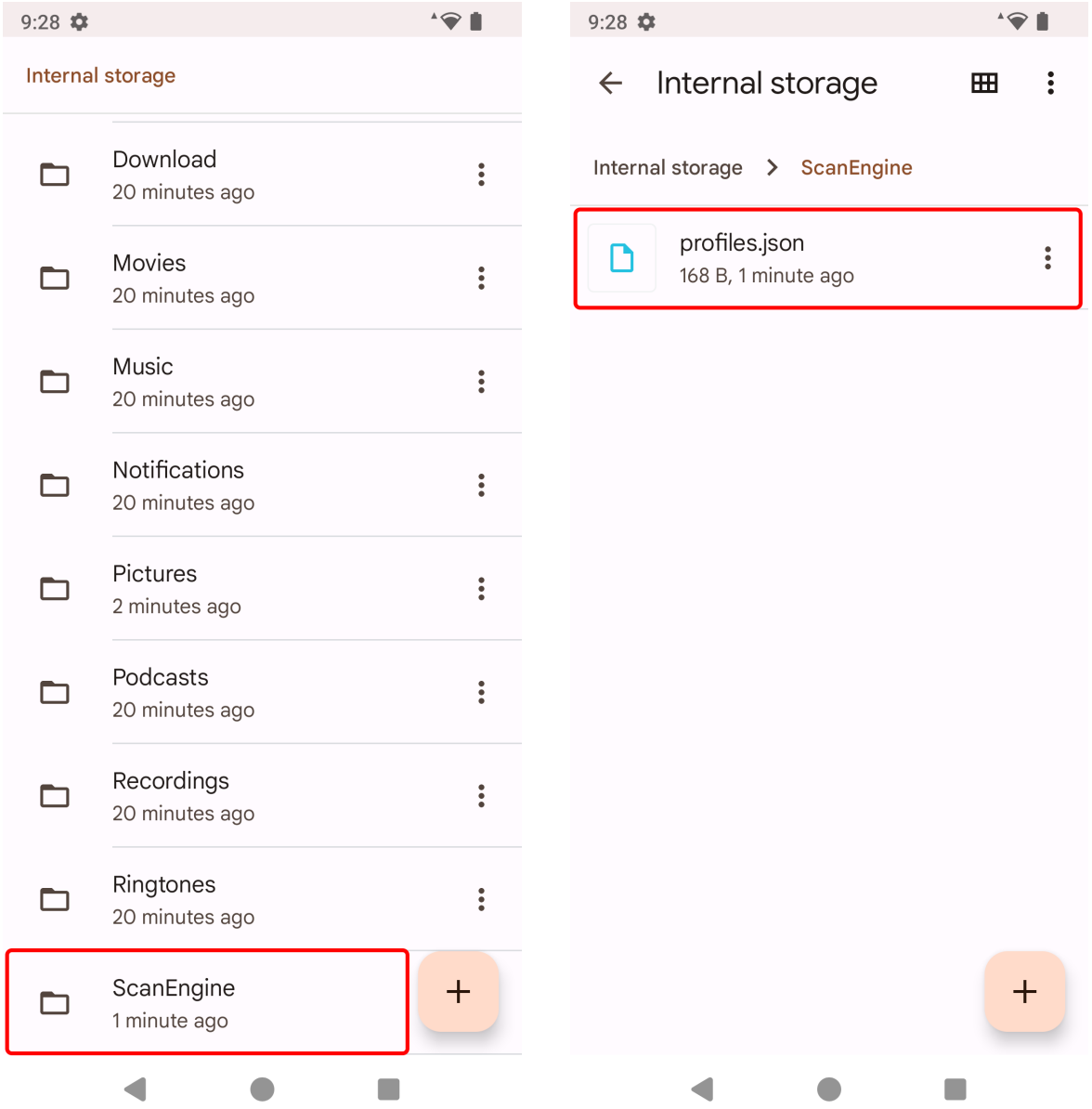


Upon successful export, a Toast notification will be displayed as shown above. Currently, the JSON export is saved to a set location at `/sdcard/ScanEngine/profiles.json` (the `profiles.json` file in the `ScanEngine` folder on shared storage), as shown in the Navigation examples below:

Windows Explorer shell:



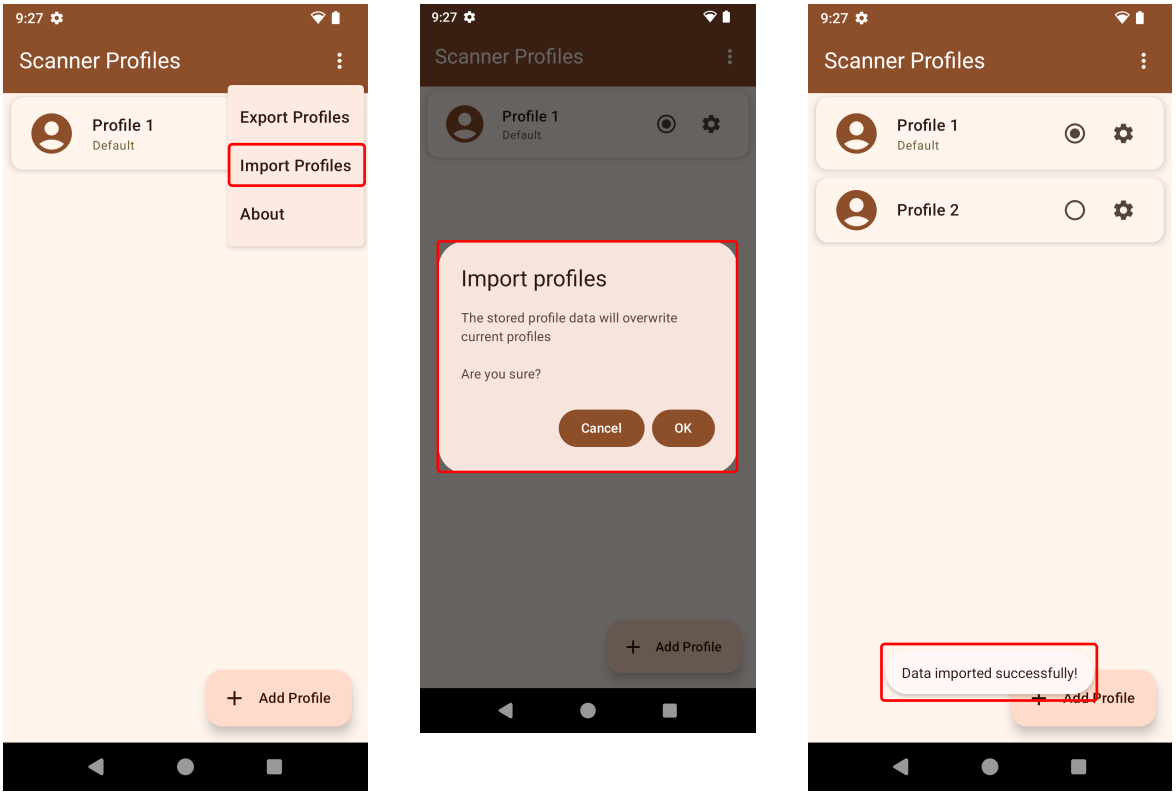
Files utility shell:



Import Profiles

Currently, only one JSON file at a set location (`/sdcard/ScanEngine/profiles.json` , the `profiles.json` file in the `ScanEngine` folder on shared storage) can be imported using this UI feature.

Open **Scan Engine > Overflow/3-Dot Menu > Import Profiles**.



Upon successful import, a Toast notification will be displayed as shown above.

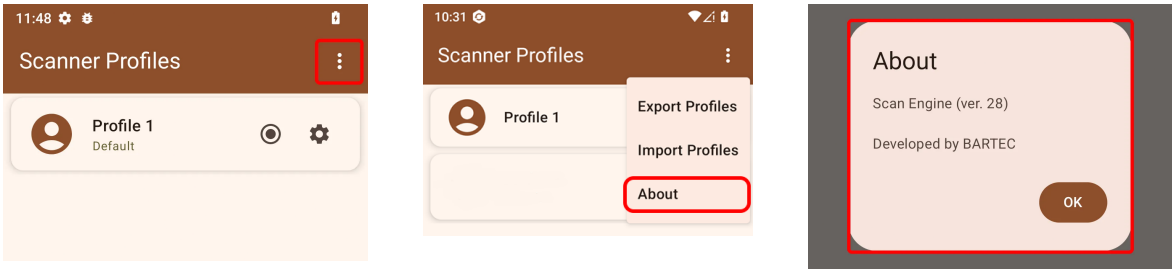
Note that all existing profiles are overwritten as this feature is intended as a full restore of the Scan Engine database.

We also implement programatic support for importing a profile JSON via Intents, a feature intended for interfacing with our `OEMConfig`. Still, a valid JSON uploaded to shared storage can be imported by sending `com.bartec.scanengine.action.IMPORT_PROFILES` with the optional `file_path` information.

About Package Version

When reporting bugs, or to ensure installation of the latest SW package, the user may check the current Scan Engine version in the About menu, on the main UI screen, as depicted below.

Open **Scan Engine > Overflow/3-Dot Menu > About**.



Profile Configuration

The profile settings described below are accessed via the right-most gear icon at each entry.

Profile Name

Allows renaming the current profile name.

Output Configuration

Define the output method, data format and feedback options:

- **Output Configuration**: Keyboard Wedge or Custom Intent.
- **Post-processing options**: choose Prefix, Suffix and/or more complex Pattern Replacement options.
- **Feedback Options**: audio and/or haptic scanning feedback.

See more details about these options below.

Assigned Applications

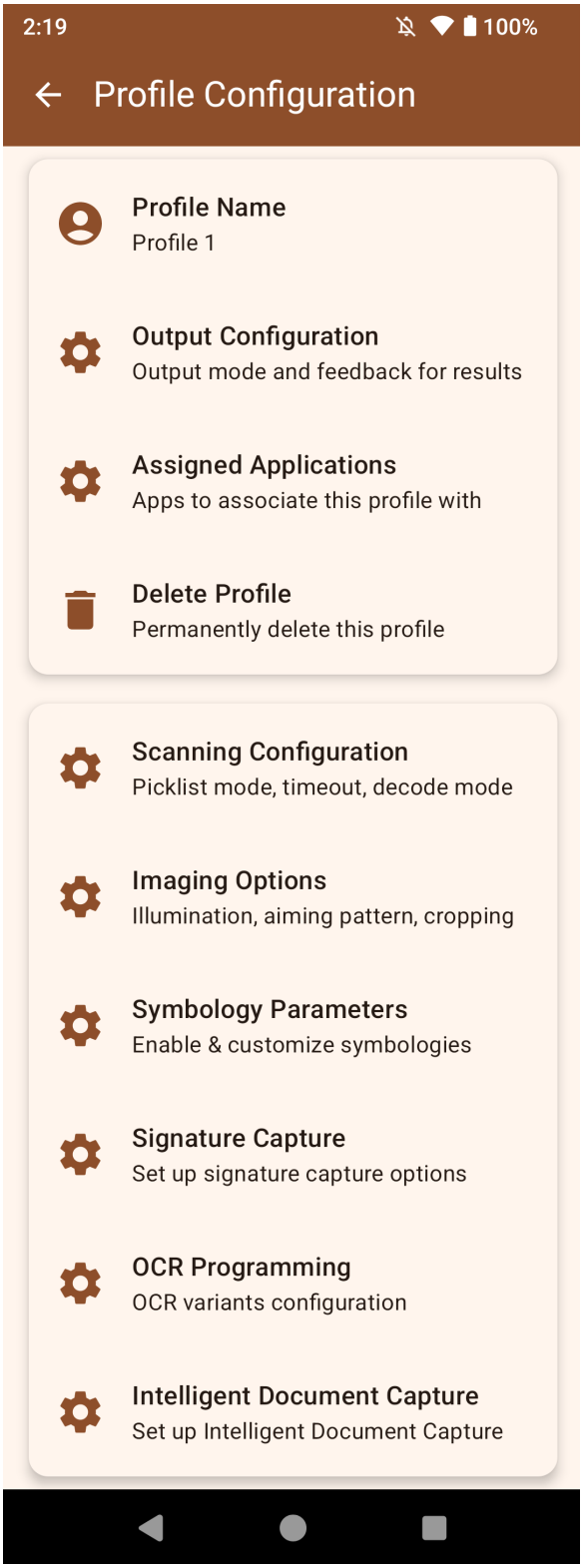
Specify whether the profile is used for all applications or only for selected ones, when they're in the foreground.

See more details about these options below.

Delete Profile

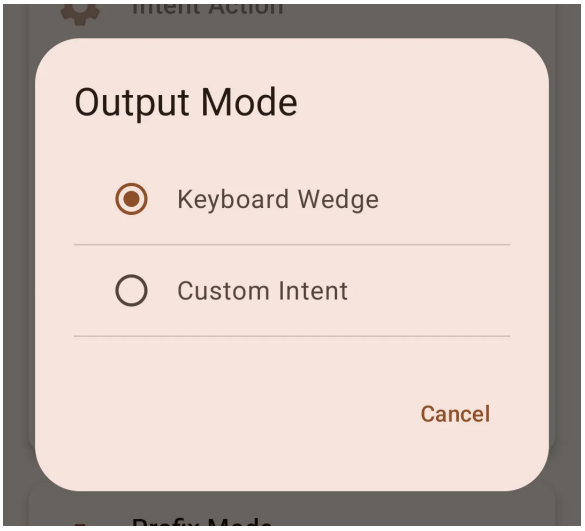
Allows deleting the current profile.

Keep in mind that the Scan Engine stack can operate with no profiles, in which case it falls back to the immutable default parameter set.



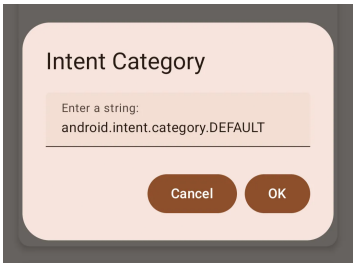
The **Output Mode** can be:

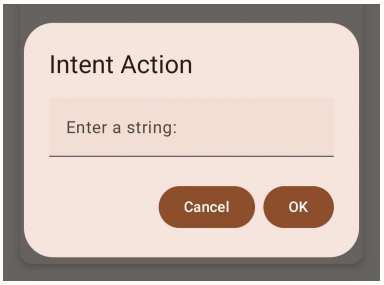
- **Keyboard Wedge** (Default): scanned data output emulates a keyboard input, injected in the active text field (foreground app).
- **Custom Intent:** scanned data output is sent via Intent IPC, to apps that register themselves as listeners for the broadcasts defined here.

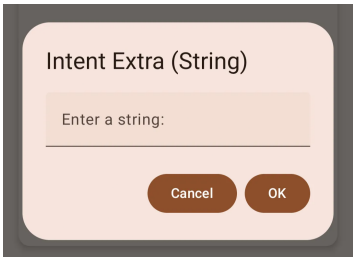


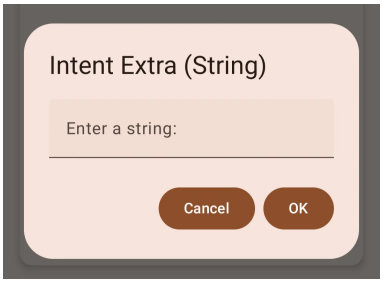
Custom Intents are defined by setting:

- Intent Category
- Intent Action
- Intent Extra (String)
- Intent Extra (Byte Array)

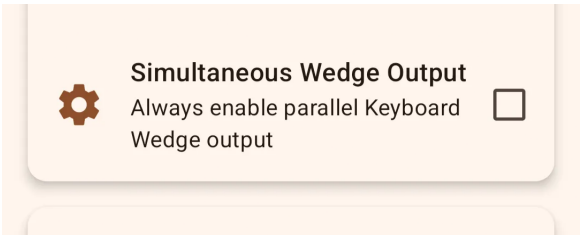








Keep in mind that, in **Custom Intent** mode, parallel Keyboard Injection is permitted if the **Simultaneous Wedge Output** is enabled here.



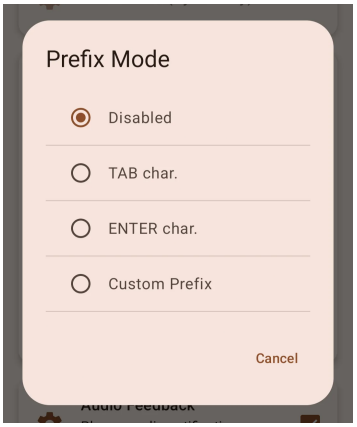
Prefix/Suffix Mode:

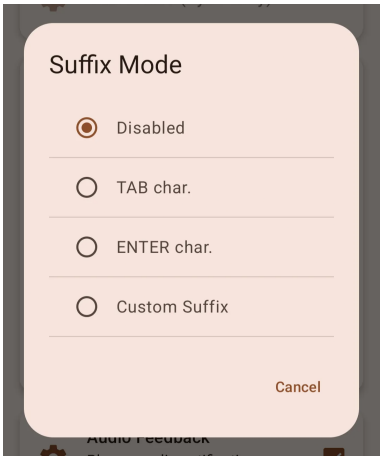
You can choose between predefined special characters, or supply a custom string here.

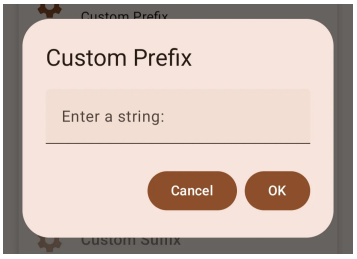
The current predefined chars are:

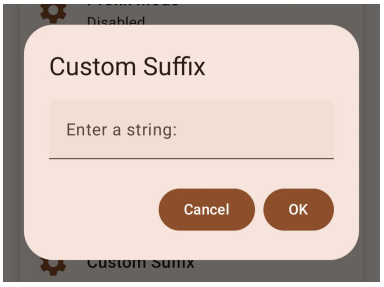
- TAB character
- ENTER character

We plan to add the ability to input these directly from keyboard, and to allow various combinations thereof.









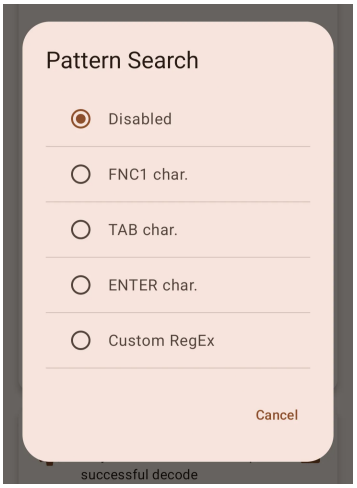
Search/Replace Pattern:

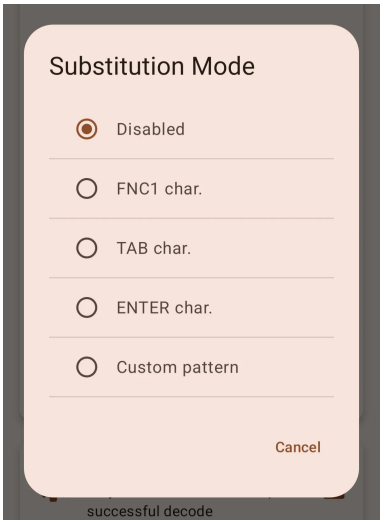
You can choose between predefined special characters, or supply a custom string here.

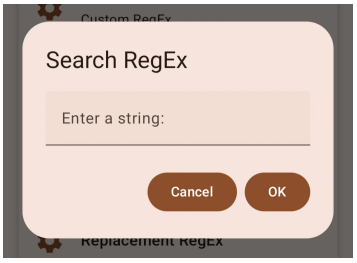
The current predefined chars are:

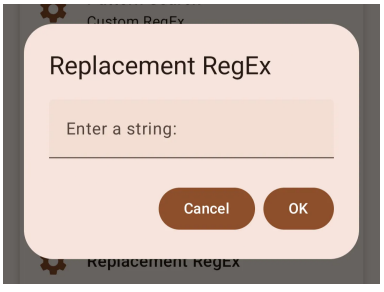
- FNC1 character
- TAB character
- ENTER character

In the **Custom RegEx/pattern** mode, you can set a free data string to be used as search pattern, and/or replacement, respectively, for scanner results.



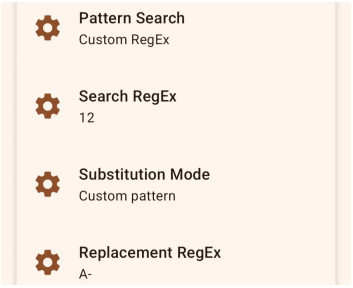


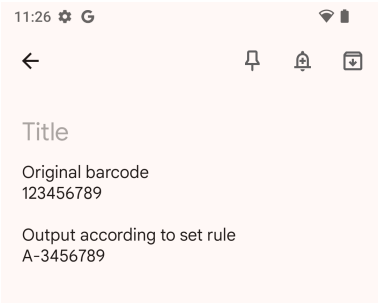




A simple/test example for custom search and replace is depicted below.

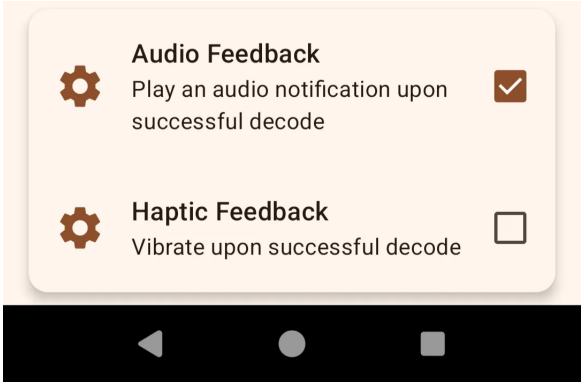
With the original barcode result `123456789`, searching for `12` for substitution with `A-`, yields `A-3456789`.

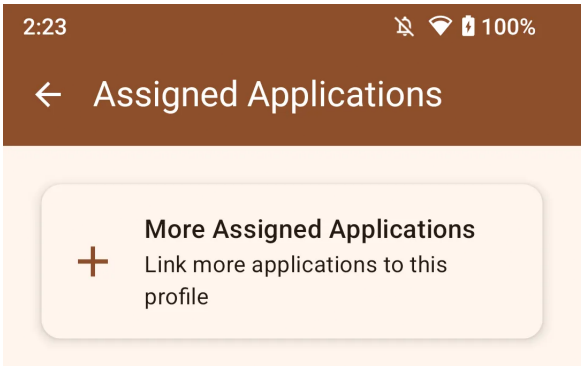


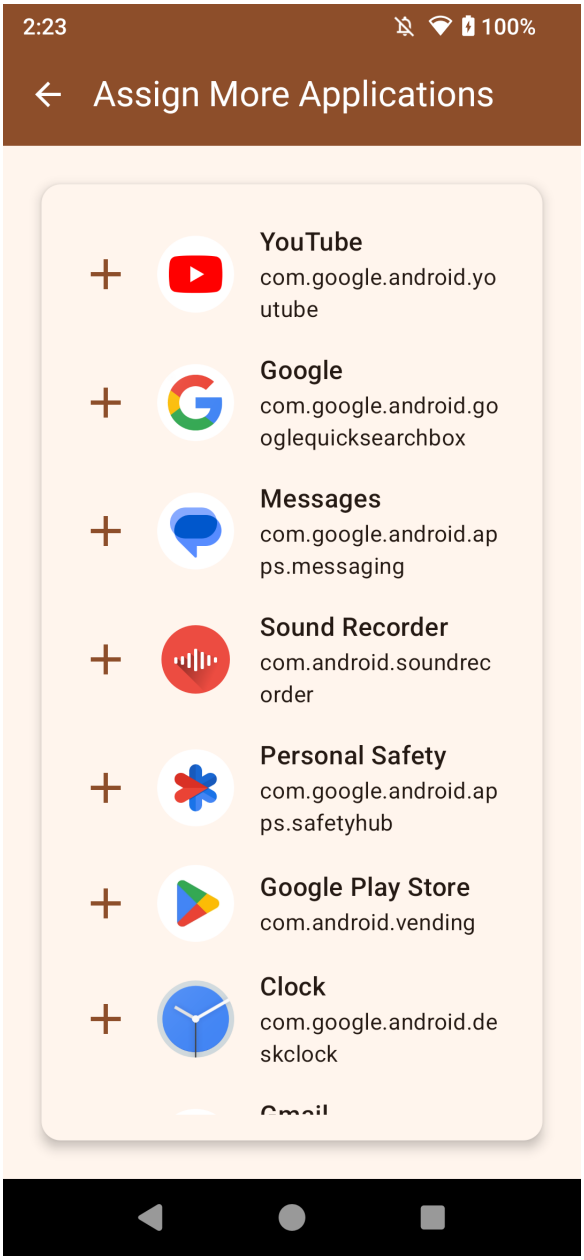


Upon successful barcode scan events, one can control the available feedback modes by toggling these checkboxes:

- **Audio Feedback**: a short beep
- **Haptic Feedback**: a short vibration







The **Assigned Applications** feature allows overriding the active profile selection for the current scanning event.

- When no application is selected here, which is the default, the active profile selection and associated parameter set is not overridden.
- Upon Assigning More Applications from this page, active profile rules are changed as follows:
  - If the foreground app is linked to an existing profile, that profile becomes active for the current scanning event.
  - Otherwise, normal rules apply for profile selection, as described at the beginning of the Scanner Profiles section.

SE5500 Hardware Parameters

Scanning Configuration

The following parameters are exposed in the UI to control the Scanning Configuration.

Title	Zebra ID	Summary	Options	Default	Requirement
Trigger Mode	138		0: Level, 7: Presentation Mode, 9: Auto Aim, 14: Timed Release	0	

Title	Zebra ID	Summary	Options	Default	Requirement
Picklist Mode	402		0: Disabled Always, 2: Enabled Always, 4: Enabled Software Picklist	0	
Decode Session Timeout	136		Enter a number from 0.5 to 9.9 sec.	99	
Timeout Between Decodes, Same Symbol	137		Enter a number from 0.0 to 9.9 sec.	6	
Continuous Bar Code Read	649	Report every bar code scanned after Timeout Between Decodes, Same Symbol while the trigger is pulled.		0	
Transmit Code ID Character	45		0: None, 1: AIM Code ID Character, 2: Symbol Code ID Character	0	
Transmit "No Read" Message	94			0	
Fuzzy 1D Processing	514	Disable only if decoding delays with 2D bar codes, or no decodes.		1	
Mobile Phone/Display Mode	716	Improves bar code reading performance on mobile phones and electronic displays.		0	
Multi Decode Mode	900	Enables decoding multiple bar codes within field of view.		0	

Title	Zebra ID	Summary	Options	Default	Requirement
Bar Codes to Read	902	Enter an integer from 1 to 30.		1	Multi Decode Mode != 0
(Full Read Mode)	901	When Multi Decode Mode is enabled, complete decode event when at least the number of bar codes set in Bar Codes to Read are decoded.		1	Multi Decode Mode != 0
Engine Orientation	624	Enables scanning reversed images, as if seen through a mirror.		0	

Imaging Options

The following parameters are exposed in the UI to control Imaging Options.

Title	Zebra ID	Summary	Options	Default	Requirement
Illumination Power Level	764	This parameter affects both decoding and motion illumination.	Enter a number from 0 to 10 pix.	10	
Thermal Management Mode	1894	Adjusts the illumination and aim duration according to the engine temperature. (hidden = true)		0	
Motion Detection Sensitivity	1943		0: Low, 1: Medium, 2: High	2	
Skip Stop Acquisition Command	1895	Don't send to engine when decode session completes.		0	
Decoding Illumination	298	Enable or disable illumination.		1	
Decode Aiming Pattern	306			1	

Title	Zebra ID	Summary	Options	Default	Requirement
Hands-free Decode Aiming Pattern	590			1	
Image Capture Illumination	361			1	
Motion Illumination	762			1	
Snapshot Mode Timeout	323		0: 30 sec., 1: 60 sec., 2: 90 sec., 3: 120 sec., 4: 150 sec., 5: 180 sec.	0	
Snapshot Aiming Pattern	300			1	
Image Cropping	301	Crops the image according to options in Crop to Pixel Addresses.		0	
Top Pixel Address for Cropping	315		Enter a number from 0 to 955 pix.	0	Image Cropping != 0
Left Pixel Address for Cropping	316		Enter a number from 0 to 1275 pix.	0	Image Cropping != 0
Bottom Pixel Address for Cropping	317		Enter a number from 4 to 959 pix.	479	Image Cropping != 0
Right Pixel Address for Cropping	318		Enter a number from 4 to 1279 pix.	751	Image Cropping != 0
Image Resolution	302		0: Full, 1: 1/2, 3: 1/4	0	
Image File Format Selector	304		1: JPEG File Format, 3: BMP File Format, 4: TIFF File Format	1	
JPEG Image Options	299	Optimize for quality, instead of size.		1	
JPEG Quality Value	305		Enter a number from 5 to 100:	65	

Title	Zebra ID	Summary	Options	Default	Requirement
Image Enhancement	564		0: Off, 1: Low, 2: Medium, 3: High	0	
Bits per Pixel	303		0: 1 BPP, 1: 4 BPP, 2: 8 BPP	2	
Video View Finder	324			0	
Video Scaling Resolution	761		0: Full, 1: 1/2, 2: 1/3, 3: 1/4	2	
Retrieve Last Decoded Image	905			0	

Symbology Parameters

The following parameters are exposed in the UI to control supported Symbologies.

Signature Capture

The following parameters are exposed in the UI to control Signature Capture.

Title	Zebra ID	Summary	Options	Default	Requirement
Signature Capture	93	Enable or disable ...		0	
Signature Capture File Format Selector	313		1: JPEG Signature Format, 3: BMP Signature Format, 4: TIFF Format	1	Signature Capture != 0
Signature Capture Bits per Pixel	314		0: 1 BPP, 1: 4 BPP, 2: 8 BPP	2	Signature Capture != 0
Signature Capture Width	366		Enter a number from 1 to 1280.	400	Signature Capture != 0
Signature Capture Height	367		Enter a number from 1 to 960.	100	Signature Capture != 0
Signature Capture JPEG Quality	421		Enter a number from 5 to 100.	65	Signature Capture != 0

OCR Programming

The following parameters are exposed in the UI to control Optical Character Recognition.

Title	Zebra ID	Summary	Options	Default	Requirement
Enable OCR-A	680			Off	

Title	Zebra ID	Summary	Options	Default	Requirement
OCR-A Variant	684		0: OCR-A Full ASCII, 1: OCR-A Reserved 1, 2: OCR-A Reserved 2, 3: OCR-A Banking	0	
Enable OCR-B	681			Off	
OCR-B Variant	685		0: OCR-B Full ASCII, 1: OCR-A Banking, 2: OCR-B Limited, 3: OCR-B Travel Document Version 1 (TD1) 3-Line ID Cards, 4: OCR-B Passport, 6: OCR-B ISBN 10-Digit Book Numbers, 7: OCR-B ISBN 10 or 13-Digit Book Numbers, 8: OCR-B Travel Document Version 2 (TD2) 2-Line ID Cards, 9: OCR-B Visa Type A, 10: OCR-B Visa Type A, 11: OCR-B ICAO Travel Documents, 19: OCR-B France ID, 20: OCR-B Travel Document 2 or 3-Line ID Cards Auto-Detect	0	
MICR E13B	682			Off	
US Currency Serial Number	683			Off	
OCR Orientation	687		0: 0° to the imaging engine, 1: 270° clockwise/90° counter, 2: 180° (upside down), 3: 90°	0	

Title	Zebra ID	Summary	Options	Default	Requirement
			clockwise, 4: Omnidirectional		
OCR Lines	691		1: Decode OCR 1 Line, 2: Decode OCR 2 Lines, 3: Decode OCR 3 Lines	1	
OCR Minimum Characters	689	Set the minimum number of OCR characters (w/o spaces) to decode per line.	Enter a number from 3 to 100:	3	
OCR Maximum Characters	690	Set the maximum number of OCR characters (w/o spaces) to decode per line.	Enter a number from 3 to 100:	100	
OCR Subset	686	Define a custom group of characters in place of a preset font variant.		(empty string)	
OCR Quiet Zone	695	Set the maximum number of OCR characters (w/o spaces) to decode per line.	Enter a number from 20 to 99:	50	
OCR Template	547	Define a template for matching scanned characters to a desired input format.		54R	
OCR Check Digit Modulus	688	Set OCR module check digit calculation.	Enter a number from 1 to 99:	1	
OCR Check Digit Multiplier	700	Set OCR check digit multipliers for the		121212121212	

Title	Zebra ID	Summary	Options	Default	Requirement
		character positions.			
OCR Check Digit Validation	694	Use OCR Check Digit Validation to protect against scanning errors.	0: No Check Digit, 1: Product Add right to left, 2: Digit Add right to left, 3: Product Add left to right, 4: Digit Add left to right, 5: Product Add right to left Simple Remainder, 6: Digit Add right to left Simple Remainder, 9: Health Industry - HIBCC43	0	
Inverse OCR	856		0: Regular Only, 1: Inverse Only, 2: Autodiscriminate	0	

Intelligent Document Capture

The following parameters are exposed in the UI to control Intelligent Document Capture.

Title	Zebra ID	Summary	Options	Default	Requirement
IDC Operating Mode	594	Sets the operating mode of the Intelligent Document Capture.	0: Off, 1: Anchored, 2: Free-Form, 3: Linked	0 (Off)	None
IDC Symbology	655	Select the bar code type(s) to use when not set to Off.	Enter a number from 1 to 255.	1	Operating mode != Off
IDC X Coordinate	596	Horizontal offset relative to the barcode's center.	Enter a number from -1279 to 1279.	0	Operating mode == Anchored
IDC Y Coordinate	597	Vertical offset relative to the barcode's center.	Enter a number from -1023 to 1023.	0	Operating mode == Anchored

Title	Zebra ID	Summary	Options	Default	Requirement
IDC Width	598	Width of the capture region.	Enter a number from 10 to 1279.	300	Operating mode == Anchored
IDC Height	599	Height of the capture region.	Enter a number from 10 to 1279.	50	Operating mode == Anchored
IDC Aspect	595	Barcode aspect ratio of a thin bar or space.	Enter a number from 0 to 255.	0	Operating mode == Anchored
IDC File Format	601	Store images in the selected format.	1: JPEG, 3: BMP, 4: TIFF	1 (JPEG)	None
IDC Bits Per Pixel	602	Select bits per pixel for the image.	0: 1 BPP, 1: 4 BPP, 2: 8 BPP	2 (8 BPP)	None
IDC JPEG Quality	603	JPEG compression (quality) of the image.	Enter a number from 5 to 100.	65	None
IDC Find Box Outline	727	Not explicitly defined.		Off	Operating mode == Anchored
IDC Minimum Text Length	656	0 disables checking, use all bar codes.	Enter a number from 0 to 55.	0	None
IDC Maximum Text Length	657	0 disables checking, use all bar codes.	Enter a number from 0 to 55.	0	None
IDC Captured Image Brighten	654	Brightness uniformity and contrast enhancement.		On	None
IDC Captured Image Sharpen	658	Enhance image sharpness.		On	None
IDC Border Type	829	Border style for the capture region’s outline.	0: None, 1: Black, 2: White, 3: AED	0 (None)	Operating mode > Free-Form
IDC Delay Time	830	Delay before capture after a trigger, in 10 ms increments.	Enter a number from 0 to 200 (in 10 ms increment)	0	Operating mode == Free-Form
IDC Zoom Limit	651	Minimal "zoom" percentage considered for capture.	Enter a number from 0 to 100:	0	Operating mode == Anchored

Title	Zebra ID	Summary	Options	Default	Requirement
IDC Maximum Rotation	652	Max rotation (degrees) allowed for the form.	Enter a number from 0 to 45:	0	Operating mode == Anchored