nordic﮲id

NORDIC ID HH8x

NORDIC ID HH83 / NORDIC ID HH85

USER GUIDE

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1. GETTING STARTED

1.1. GENERAL

Nordic ID HH8x family is designed for quick, accurate and reliable data collection whether it is for barcode or UHF RFID reading. Featuring the Android operating system and a 4.7" HD touchscreen with high processing power. This enables sophisticated software development offering a superb user experience. The Gorilla Glass 3 touchscreen provides excellent display quality and robustness.

What makes Nordic ID HH83/HH85 RFID ACD so powerful is the Nordic ID NUR2-1W module which provides state-of-the-art UHF RFID reading performance is an ideal contemporary data collection tool.

The modular design of Nordic ID HH83 enables the only Barcode variant to be upgraded* to RFID+Barcode variant in future, instead of replacing the device.

* Upgrade must be made by authorized service centers. Upgrade ordering codes are ACN00199/200.

1.2. VARIANTS

1.2.1. NORDIC ID HH83 VARIANTS

The Nordic ID HH83 is available in 5 different variants (all of them with WLAN interface, rear camera and NFC reader) that are:

CODE	FREQUENCY	RFID ACD	2D IMAGER	4G
HTH00001	N/A	No	Yes	No
HTH00002	N/A	No	Yes	Yes
HTH00004	868 MHz (ETSI)	Yes	Yes	No
HTH00005	868 MHz (ETSI)	Yes	Yes	Yes
HTH00007	915 MHz (FCC)	Yes	Yes	No

Picture 1 Nordic ID HH83 RFID ACD (left) and Nordic ID HH83 Barcode (right) variants

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1.2.2. NORDIC ID HH85 VARIANTS

The Nordic ID HH85 is available in 3 different variants (all of them with WLAN interface, rear camera and NFC reader) that are:

CODE	FREQUENCY	RFID ACD	2D IMAGER	4G
HTH00008	868 MHz (ETSI)	Yes	Yes	No
HTH00009	868 MHz (ETSI)	Yes	Yes	Yes
HTH00010	915 MHz (FCC)	Yes	Yes	No
HTH00011	920 MHz (China, Japan)	Yes	Yes	No
HTH00012	920 MHz (China, Japan)	Yes	Yes	Yes

Picture 2 Nordic ID HH85 RFID ACD

1.3.   AVAILABLE ACCESSORIES

1.3.1.   NORDIC ID HH83 AND NORDIC ID HH85 ACCESSORIES

CODE	DESCRIPTION
ACN00190	HH83 Desktop Charger Kit EU
ACN00191	HH83 Desktop Charger Kit UK
ACN00192	HH83 Desktop Charger Kit US
ACN00193	HH83 4-Bay Desktop Charger Kit EU
ACN00194	HH83 4-Bay Desktop Charger Kit UK
ACN00195	HH83 4-Bay Desktop Charger Kit US
ACN00182	HH83 USB Type-C-to-Ethernet Adapter
ACN00183	Wall adapter QuickCharge3 USB Type-C kit, EU UK US

Picture 3 USB Type-C-to-Ethernet Adapter

NOTE! When using the 4-slots desktop cradle, one USB-C to Ethernet adapter
is needed for each Nordic ID HH83 or HH85 device using Ethernet
communication, i.e., up to 4 adapters might be connected to the 4-bays cradle.

1.3.2. NORDIC ID HH83 ONLY ACCESSORIES

CODE	DESCRIPTION
ACN00180	HH83 Spare Battery 6700mAh with Cover
ACN00181	HH83 Spare Battery 3350mAh with Cover
ACN00205	Nordic ID HH83 belt holster

Picture 4 Nordic ID HH83 belt holster

1.3.3. NORDIC ID HH85 ONLY ACCESSORIES

CODE	DESCRIPTION
ACN00204	Nordic ID HH85 Battery 10050mAh with Pistol grip cover

Picture 5. Removing the Nordic ID HH85 battery cover

1.4.   INBOX CONTENT

Nordic ID HH83/HH85 inbox contains following items

- Nordic ID HH83/HH85 device
- Changeable battery (pre-installed inside the unit).
    - 3350mAh battery included in Nordic ID HH83 Barcode variants
    - 6700mAh battery included in Nordic ID HH83 RFID ACD variants
    - 10050mAh battery with pistol grip included in Nordic ID HH85 RFID ACD variants
- Wrist strap
- Safety and regulations card

1.5.   REMOVING AND INSTALLING THE BATTERY
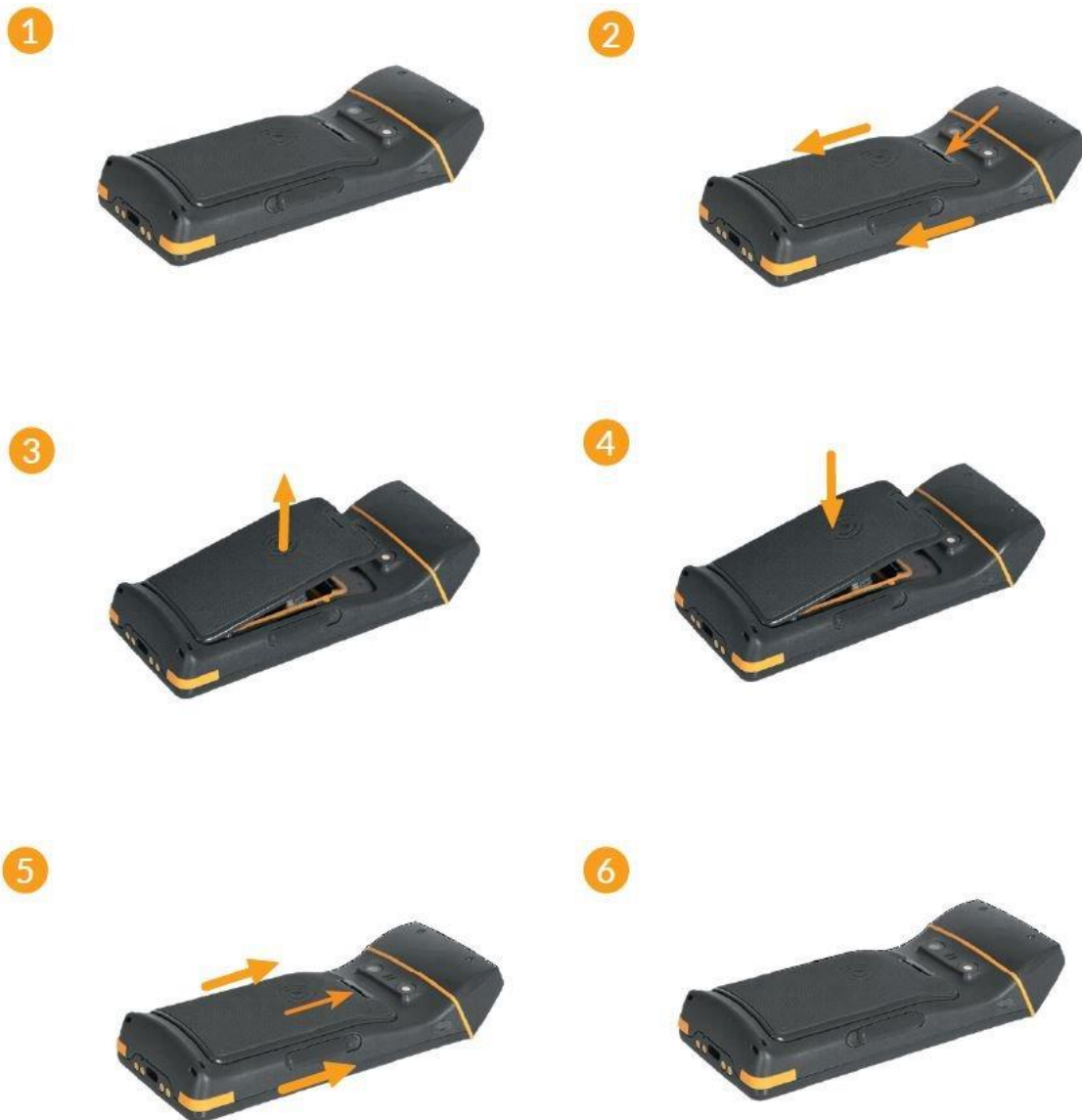
Picture 6 Removing and installing battery

1.5.1. BATTERY "HOT SWAP"

The Nordic ID HH83/HH85 provides a battery "hot swap" functionality which the user can activate from the Android "power off" menu (displayed when Power button is pressed during 1 second). This feature allows removing a (discharged) battery and installing a fully charged one in a matter of seconds, thus allowing a larger usage time of the device when having extra batteries for replacement.

When selecting "Battery Hotswap", the device will go to sleep mode and, <u>after waiting for a short vibration</u>, then the user can swap the battery without losing any data, as the device will not reboot or power off as it would do without "hot swap" support.
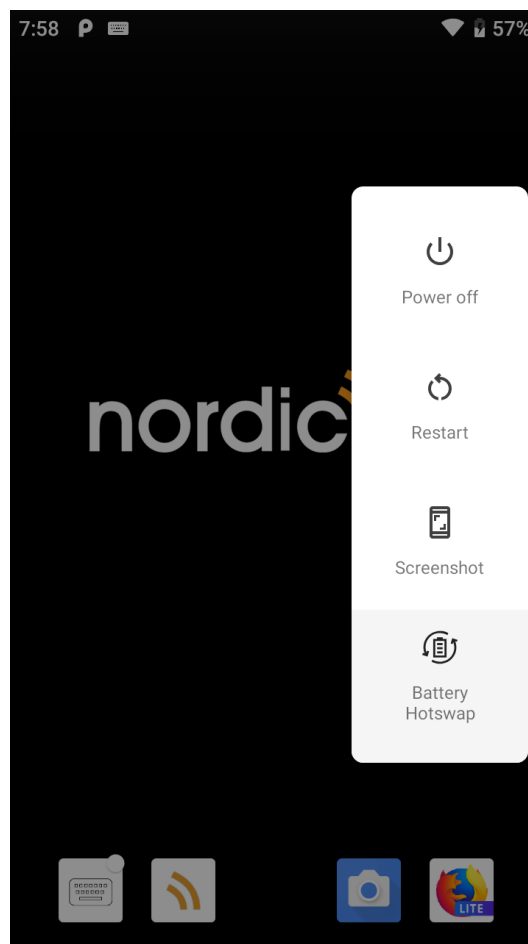
Screenshot 1

1.6. CHARGING

1.6.1. NORDIC ID HH83/HH85 CHARGING

> **NOTE!** Due to regulations, devices are delivered with empty battery.
> Please fully charge your device before first use.

The Nordic ID HH83/HH85 can be charged via desktop or USB-C charger. The USB charger needs to have a USB-C connector and preferably support for Quick Charge 3.0.

Charging time from 0 – 100% via the desktop and Quick Charge 3.0 USB charger is about 4 hours for both Nordic ID HH83 Barcode and RFID ACD variants.

Due to its larger battery, charging time from 0 – 80% is about 4 hours for Nordic ID HH85 RFID ACD, and 6 hours to 100%.

The status LED on the unit shows the charging progress:

- 🔴 red when battery level is below 15%
- 🟡 yellow when it's between 15% and 90%
- 🟢 green when it's above 90%

Picture 7 Charging of the Nordic ID HH83 via USB charger

> **NOTE!** The USB-C and desktop chargers are sold separately by Nordic ID.

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1.6.2. BATTERY CHARGING USING DESKTOP CHARGER

Both the battery in the Nordic HH83 plus a spare battery can be charged simultaneously in the desktop charger. This means that when using the Nordic ID HH83 4-Bay Desktop Charger, four Nordic ID HH83 devices plus four extra batteries can be charged at the same time, i.e., eight batteries.

NOTE! that one Nordic ID HH85 with pistol grip and one spare battery with pistol grip cover cannot be charged in the same bay of a desktop charger.

Picture 8 Nordic ID HH83 single Desktop Charger and 4-Bay Desktop Charger

EXTRA BATTERY SLOT

USB-C PORT
(back side)

POWER STATUS

COMMUNICATION MODE
LED

BATTERY STATUS LED

Picture 9 Features of Nordic ID HH83 Desktop Charger

The behavior (color) of the LEDs depends on how the main Nordic ID HH83/HH85 unit is being connected (using the USB-C port) to external devices or network and whether an extra battery is being charged or not:

- Power status LED
  - 🟢 Green when the desktop charger is connected to power

- Communication mode LED
  - ⚪ Off when there is nothing connected to USB-C port
  - 🟢 Green when the Nordic ID HH83/85 unit is in client mode (e.g., connected to a computer via USB)
  - 🔵 Blue when the Nordic ID HH83/HH85 unit is in host mode (e.g., connected to a network using USB to Ethernet adapter)

- Extra battery status LED
  - 🔴 Red when a Nordic ID HH83/HH85 battery is being charged
  - 🟢 Green when a Nordic ID HH83/HH85 battery is fully charged

1.7. FEATURES OVERVIEW
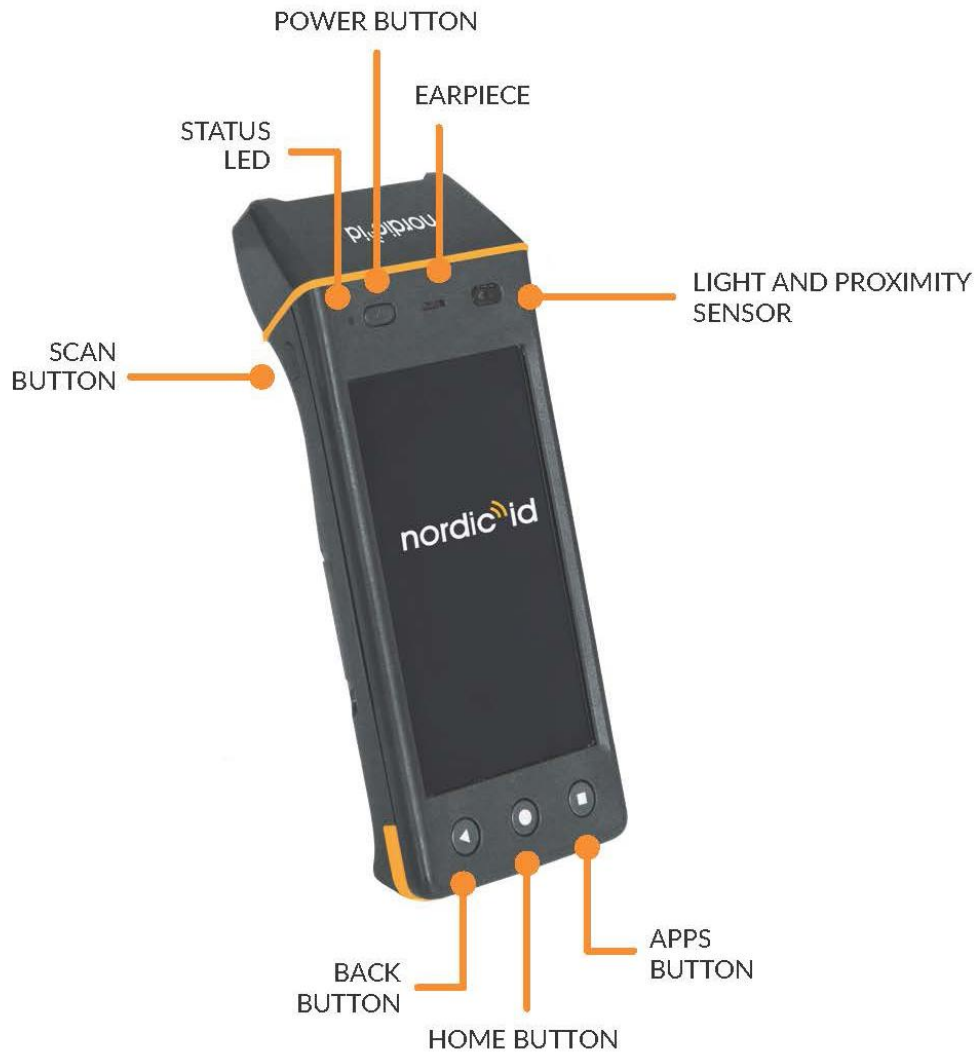
Picture 10 Nordic ID HH83 keys and user interface (front side)

The three buttons below the screen map the typical on-screen Android buttons.

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Picture 11 Features of Nordic ID HH83 (back side)

The variant shown in Picture 10 and Picture 11Picture 8 is Nordic ID HH83 Barcode. Keys and user interactions are the same in Nordic ID HH83 RFID ACD and Nordic ID HH85 RFID ACD, except:

- Nordic ID HH83 RFID ACD and Nordic ID HH85 RFID ACD do not have built-in ToF sensor.
- Module containing the barcode scanner also builds the RFID UHF reader and antenna.

The Nordic ID HH85 RFID ACD also includes a scan button on the pistol grip:

Picture 12 Nordic ID HH85 RFID ACD

2. USING THE DEVICE

2.1. BUTTONS

The Nordic ID HH83/HH85 devices include six physical keys for user interactions. Location of the keys can be seen in the Picture 10.

Both Nordic ID HH83 Barcode and RFID ACD variants include two side keys for triggering UHF RFID and/or barcode reading, allowing usage with both right and left hands.

The Nordic ID HH85 RFID ACD also includes a trigger on the pistol grip, besides of the two side keys.

2.1.1. SCAN BUTTONS

The trigger (SCAN) buttons are in Nordic ID HH83 on both sides of the device, and also on the pistol grip in the Nordic ID HH85. Depending on the application in use, the trigger button starts/stops UHF RFID or barcode reading. By default, the first press of the button starts the reading and the second press of the button stops it.

> **NOTE!** By default, side buttons in Nordic ID HH8x don't wake up the reader if sleeping.

Scanning is the default behavior of these side keys when using Nordic ID applications such as Nordic ID RFID Demo, Nordic ID Keyboard Wedge or Nordic ID Radea Mobile Client.

The scan buttons information (status) is also available for 3rd party applications via the Android API, as a push or release event, so that their behavior can be customized.

2.1.2. POWER KEY

Power key turns the device On/Off. The power key can be used also to wake the device up if it's sleeping and displaying the "Power off" menu if the key is pressed continuously for 1 second.

When pressing the power key continuously for 8 seconds, the device will reboot immediately.

2.1.3. HOME KEY

⦿ Home key will show the menu of Android OS and/or application if supported by the view/application or move back to the home screen from any application.

2.1.4. BACK KEY

◀ Back key equals to tapping a "Return" or "Previous" button in any application. It behaves as the "back" Android button.

2.1.5. APPS TASK MANAGER KEY

▣ Apps key will show the task manager of Android OS. It behaves as the "apps" Android button.

2.2.   STATUS LED

Whilst the Nordic ID HH83/HH85 is being charged, using either the USB-C charger or the Nordic ID HH83 desktop charger, the status LED indicates the charging progress, i.e. battery level, of the device:

🔴 red when battery level is below 15%
🟡 yellow when it's between 15% and 90%
🟢 green when it's above 90%

2.3.   SENSORS

The Nordic ID HH83/HH85 includes several sensors which can be seen in the Picture 10 and Picture 11.

2.3.1. TOF SENSOR

The ToF sensor is located on the top front side of the Nordic ID HH83 Barcode device, by the barcode scanner. It is used to trigger barcode scanning instead of using the Scan button. ToF mode is disabled by default. When enabled, the ToF sensor sends an artificial light signal. Barcode scanning is automatically performed while any item interrupts this signal, e.g., an object finger is placed in front of the sensor at a given (customizable) distance.

Enable and play with ToF sensor using Nordic ID RFID Demo in Android → *Settings* → *Sensor*
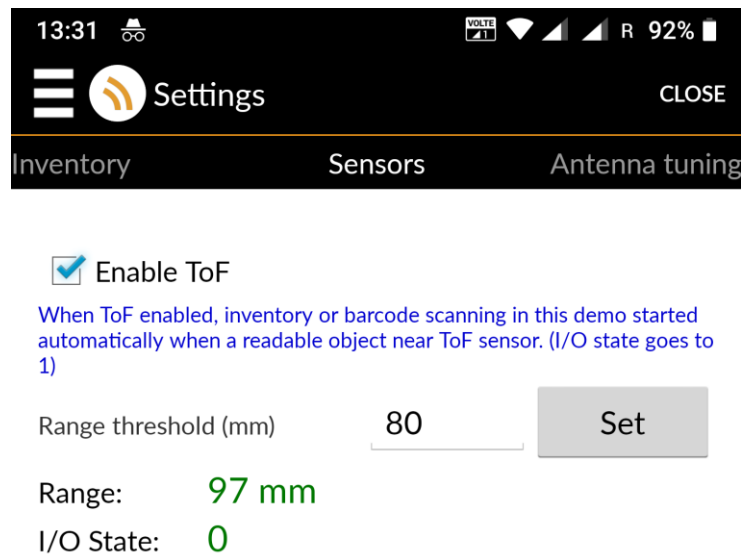
Screenshot 2

2.3.2. LIGHT AND PROXIMITY SENSOR

The light and sensors are located on the front side of the device, by the ear speaker.

The light sensor is used to adjust the brightness of the screen according to the ambient light (if the display brightness level is set to adaptative).

The proximity sensor detects when you have the phone up to your ear, so that touchscreen is switched off to prevent accidental tapping.

2.3.3. NFC READER

An NFC reader is located on the back side of the Nordic ID HH83/HH85. NFC antenna is indicated with a ((waves)) icon in the Nordic ID HH83 (there is no icon in the Nordic ID HH85).

Multiple NFC standards are supported, proximity and vicinity, which makes Nordic ID HH83/HH85 also compliant with existing NFC Android apps.

The Nordic ID RFID Demo app can also be used to read NFC tags and get basic information.

Picture 13 Position of NFC antenna in Nordic ID HH83 and Nordic ID HH85

2.4. VOLUME

The Nordic ID HH83/HH85 has a speaker and an earpiece, which volume can be adjusted as typically done in Android devices.

The Nordic ID HH83/HH85 does not have physical volume control buttons. To change the volume of the audio, you can use the shortcut at the dropdown notification menu.

Screenshot 3

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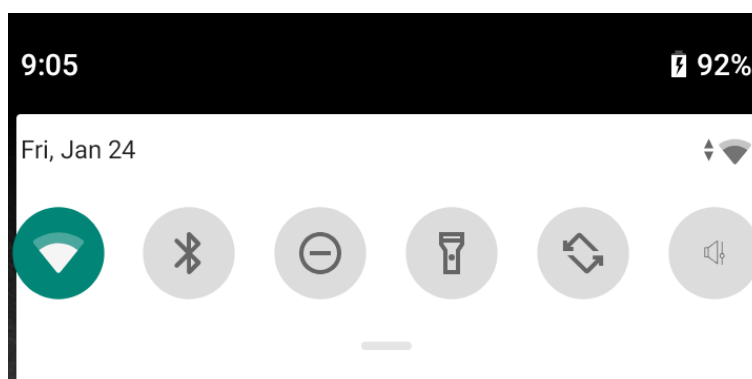
2.5.   SCANNING DIRECTIONS

To get maximum reading performance, Nordic ID HH83/HH85 reader must be handled by following these pictures showing ergonomic and easy way to hold and use the device:
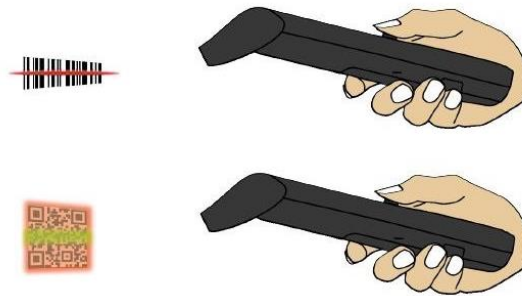
Picture 14 Scanning direction with Nordic ID HH83 Barcode
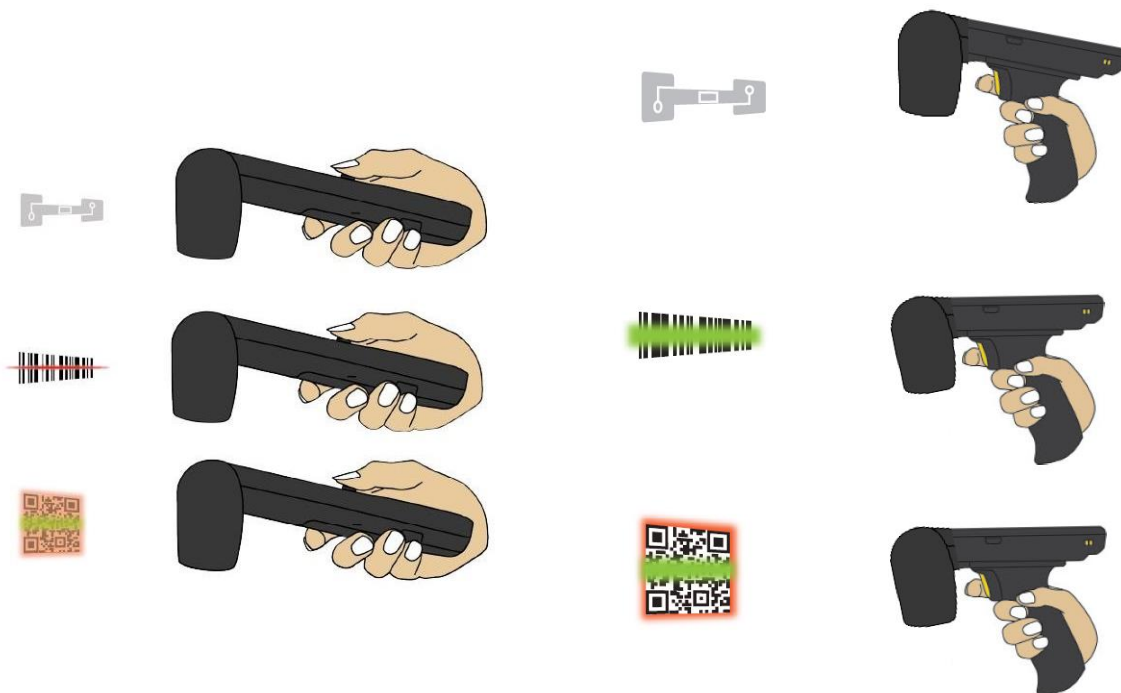
Picture 15 Scanning direction with Nordic ID HH83 RFID ACD and Nordic ID HH85 RFID ACD
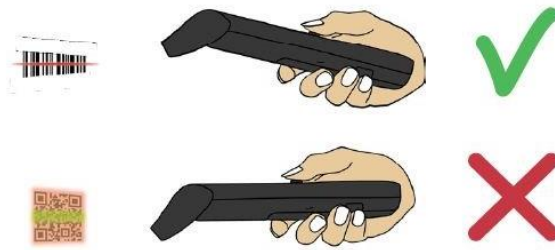
Picture 16 Correct grip of Nordic ID HH83 Barcode
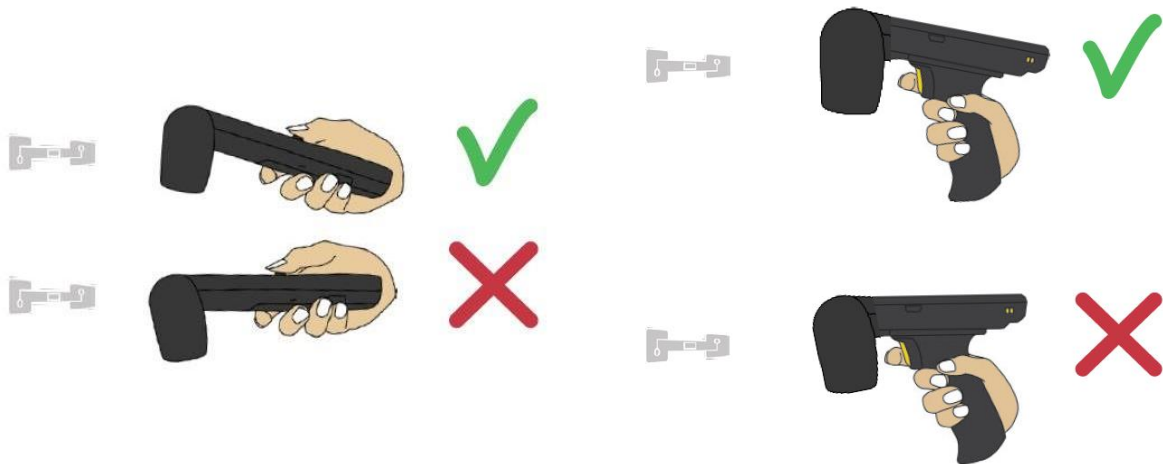
Picture 17 Correct grip of Nordic ID HH83 RFID ACD and Nordic ID HH85 RFID ACD

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2.6. NORDIC ID HH83/HH85 RFID ACD VARIANTS

Nordic ID HH83 RFID ACD and Nordic ID HH85 RFID ACD include Advanced Cross Dipole antenna that includes SW controllable (via Nordic ID RFID demo application and NUR API) antenna polarizations (vertical and/or horizontal), enabling a nominal reading distance about 15 m / 50 ft.

> **NOTE!** The reading range depends on used tag and environment

The linear antenna modes (only one antenna is enabled) are intended for long range reading when tag density is high, and tags are in horizontal or vertical position (Picture 18).

Enabling both linear antennas provides a lower reading speed but it does provide the best reading performance when tags are in random positions (Picture 19).
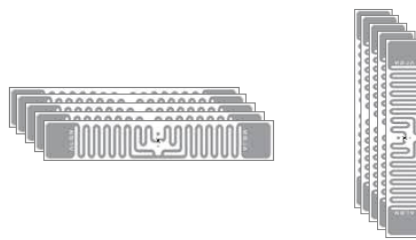
Picture 18 RFID tags in horizontal and vertical alignment
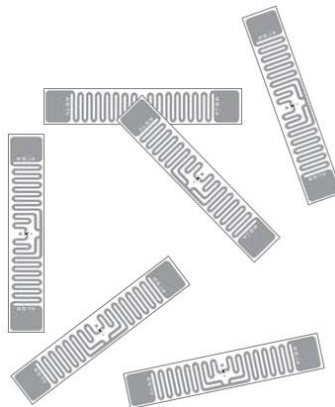
Picture 19 RFID tags in random alignment

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2.7. 2D IMAGER

This section describes methods for configuring 2D imager of Nordic ID HH83/HH85. The 2D imager module in use is Opticon MDI-4100 2D scan engine.

There are three different ways to configure the 2D imager that are

1. Using configuration barcode
2. Using Nordic ID RFID demo application
3. Configuring via NUR Accessory extension API

2.7.1. USING CONFIGURATION BARCODES

The easiest way to configure 2D imager is to read a configuration code with the 2D imager. Please use Opticon's online configuration tools to create a configuration barcode and print it onto paper. Then scan the code with the 2D imager of Nordic ID HH83 and new settings will be set and saved automatically.

Quick Instructions to generate imager configuration barcodes:

1. Opticon's online configuration tools: http://opticonfigure.opticon.com/
2. Select "*Browse*" in the left corner of the page
3. Select "*Code options*"
4. Select "*Settings of readable codes*"
5. Select "*Enabling of readable codes*"
6. Select a barcode from the list *e.g. Code 39*
7. Press "*Add*" button at the bottom
8. From right corner of the page, select "*Barcode Type*": *e.g. PDF417*
9. You can adjust the size of the code from the "*Barcode Size*"
10. Select "*Advanced*" from the lower part of the right column
11. The "*2D code*" field indicates the corresponding configuration string.

Find example configuration barcodes below. More configuration barcodes can be found at APPENDIX 1.

1 - Enable 1D codes: Tri-Optic, Industrial 2 of 5, Code 39 and S-Code

@MENU_OPTO@ZZ@JZ@R7@B2@R9@ZZ@OTPO_UNEM@

2 - Disable 1D codes: Tri-Optic, Industrial 2 of 5, Code 39 and S-Code

@MENU_OPTO@ZZ@DDJ@X4K@VB@DDK@ZZ@OTPO_UNEM@

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2.7.2. USING NORDIC ID RFID DEMO APPLICATION

Nordic ID RFID Demo application allows testing of different kind of barcode configurations effortlessly. Configurations can be read and set from specific file. The specific file is a simple text file containing configuration command strings generated by the Opticon's configuration tool. The configuration settings of Nordic ID RFID demo applications can be accessed via Settings menu or barcode functionality.

Opticon's configuration tools do provide configuration strings instead of graphic barcodes when you select "Enabling a single readable code" instead of "Enabling of readable codes" in step 4. Barcode type must be 2D-Code like PDF417. Format of configuration string is:

```
@MENU_OPTO@ZZ@<config codes separated by @>@ZZ@OTPO_UNEM@
```

Opticon's configuration tools shows two or three letter configuration code for each configurable item.

Example:

```
Enable Tri-Optic = JZ, Enable Code39 = B2
Configuration string = "@MENU_OPTO@ZZ@JZ@B2@ZZ@OTPO_UNEM@"
```

After sending configuration file to the reader, Nordic ID RFID demo will send "save settings" command automatically to the 2D imager. Source code of Nordic ID RFID demo is public, so one can study how 2D imager configuration using the specific files has been implemented on Android. See section 4.8.2 for more information.

2.7.3. CONFIGURING VIA NUR ACCESSORY EXTENSION API

NUR Accessory Extension API provides command for sending configuration string to the 2D imager:

```
byte [] imagerCmd (String cmd, int type);
cmd: Configuration string.
type: Type of imager in use (0= Opticon MDI-4100 2D scan engine)
```

Return value is byte array of response depending on command code(s) sent to the 2D imager. Null if command string is not valid. The first byte of array contains ACK (0x6 success) or NAK (0x15 fail).

Example:

```
//Send Enable Tri-Optic and Enable Code39 commands
byte [] rsp = imagerCmd("@MENU_OPTO@ZZ@JZ@B2@ZZ@OTPO_UNEM@", 0);

if(rsp[0] == null)
{
 //Not valid command
}
else if(rsp[0] == 0x6) //ACK
{
  //Config success!
}
else if(rsp[0] == 0x15) //NAK
{
  //Config failed!
}
```

After sending configuration to the 2D imager, settings are ready to use but next power down causes settings to lost. Therefore, it's important to save settings to non-volatile memory of imager.

```
//SAVE CONFIGURATION TO IMAGER MEMORY
imagerCmd ("@MENU_OPTO@ZZ@Z2@ZZ@OTPO_UNEM@", 0);
```

3. RF PROFILES

The Nordic ID HH83 RFID ACD and Nordic ID HH85 RFID ACD include the Nordic ID NUR2-1W UHF RFID module which supports three different kind of RF profiles. The profiles are Robust, Nominal and High speed. It is important to select the correct RF profile based on use case and environment. More detailed description about the RF profiles can be found below:

- **Robust**

  o Robust RF profile is intended to be used in challenging environments. It provides the best filtering against the interfering signals coming from nearby reader(s), other signal sources and from reflective environment. This profile uses link frequency of 250 kHz and Miller 4 coding scheme providing read rates up to 200 tags/s. Due to the low data speed and best filtering the Robust RF profile provides the best sensitivity.

- **Nominal**

  o Nominal RF-profile is the default setting of readers containing Nordic ID NUR2-1W UHF RFID module. It uses link frequency of 300 kHz and Miller 2 coding providing read rates up to 350 tags/s.

- **High speed**

  o High speed RF profile is intended to be used in use cases where the highest read rates are required. It uses link frequency of 400 kHz and FM0 coding and provides read rates up to 1000 tags/s. Due to the high data speed this profile is quite sensitive to interferences.

> **NOTE!** Read rates will depend from the environment, reader settings, tag population and tag type.

4. SOFTWARE

Nordic ID has taken an open source SW development approach in use with the Nordic ID HH83/HH85. Nordic ID provides the SDK along with the examples through the GitHub. The Nordic ID HH83/HH85 supports powerful NUR API so developers can use familiar NUR API for application development.

Some pre-installed applications are delivered together with Nordic ID HH83/HH85 to quickly start evaluating and using the device. It also allows installation of 3rd party applications for unlimited use cases.

4.1. NORDIC ID APPLICATIONS

Nordic ID provides following feature rich yet easy-to-use applications for Nordic ID HH83/HH85.

The applications are pre-installed on Nordic ID HH83/HH85 and shortcuts added to home screen by default.
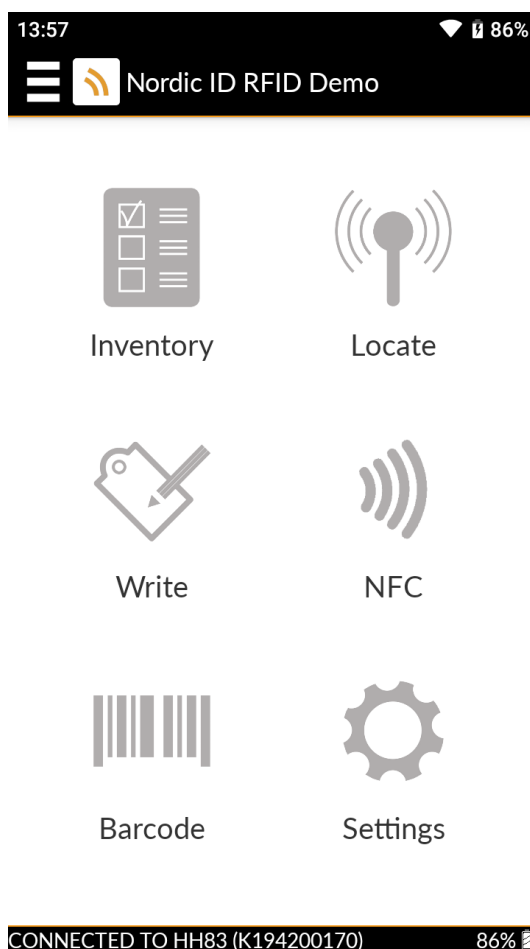

Screenshot 4

4.1.1. NORDIC ID RFID DEMO FOR ANDROID

The Nordic ID RFID Demo application for Android is a full featured application to perform different functionalities with Nordic ID HH83/HH85 and all the others Nordic ID devices supporting Android OS.

Screenshot 5

Nordic ID RFID Demo application can be used for testing the capabilities of compatible Nordic ID devices and how the various RFID settings affect the reading performance.

Nordic ID RFID Demo application enables different key features:

- RFID Inventory (EPC, TID and user memory) **
- Locate an RFID tag with a given EPC **
- Write RFID tag **
- Read NFC tag */**
- Barcode scanning */**
- Firmware update */**

* Available in Nordic ID HH83 Barcode variant
** Available in Nordic ID HH83 RFID ACD and Nordic ID HH85 RFID ACD variants

You can swipe the screens in the Nordic ID RFID Demo app to change the settings section or see the list of EPCs during an inventory.

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4.1.2. NORDIC ID WEDGE SERVICE

Nordic ID Wedge Service application provides wedge functionality for Nordic ID HH8x, so that the code of the RFID tags and barcodes scanned are typed as a keyboard input.

We suggest enabling the "Automatic start" function of NUR Wedge Settings in Nordic ID HH83 Barcode variant, if you are not using an app which was developed using the NUR API. That way, any existing 3rd party application (text editors, spreadsheets, web forms, etc) can straightaway use the barcode scanning as a keyboard input.

4.1.3. NORDIC ID APP CENTER

The Nordic ID HH83/HH85 is an Android device designed for professional use. GMS (Google Mobile Services) are not part of Nordic ID Android OS, promoting greater privacy and security of personal information by preventing location tracking and data collection.

As Google Play Store is not available in Nordic ID HH83/HH85 to prevent installation of unauthorized 3rd party applications, Nordic ID delivers the Nordic ID HH83/HH85 with a customized app catalogue: Nordic ID App Center, based on the open-source Android app repository F-Droid.

Nordic ID App Center enables the installation of 3rd party apps included in the selected repositories and keeps them updated. By default, the catalogue of apps in Nordic ID App Center include two repositories:

- Nordic ID repository, which includes the essential apps for Nordic ID HH83/HH85 devices, such as Nordic ID RFID Demo or Nordic ID Wedge.

- F-Droid repository, a wide catalogue of Open-Source Software including web browsers, pdf readers, maps and navigation, etc. All of them being secure apps without malware or virus.

With Nordic ID App Center, the user has full control of the available repositories and can add new ones to extend the number of available apps. Each repository can contain certain apps, that will be the available apps on the device for being installed by the user later on.

Advanced users can also create their own app repository (https://f-droid.org/en/tutorials/create-repo/) and upload their own Android apps, to grant the users with easy access to them, as this configuration can be exported and restored on any other device (see section 4.5).
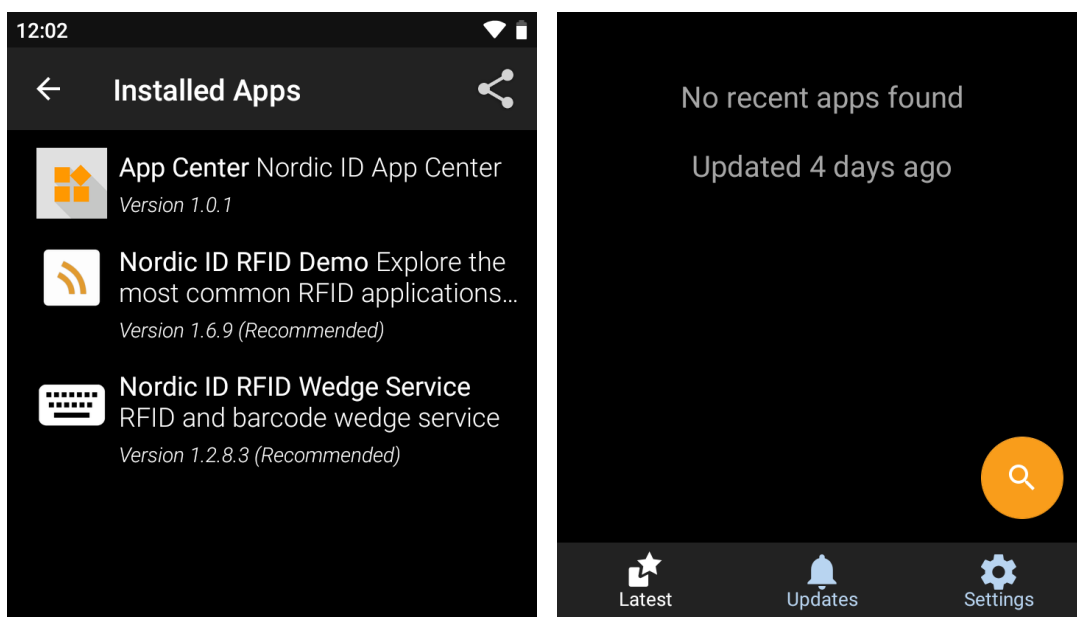
Screenshot 6

4.2. INSTALLING 3RD PARTY APPLICATIONS

A 3rd party Android app can be installed in the Nordic ID HH83/HH85 device, just by copying the APK installation file to the device and launching it using the Files app.

In order to copy a file to the Nordic ID HH83/HH85 device, please follow these instructions:

1. Connect the Nordic ID HH83/HH85 to your computer using a USB cable

2. "Tap for more options" in the drop-down USB notification, and then select "File Transfer"
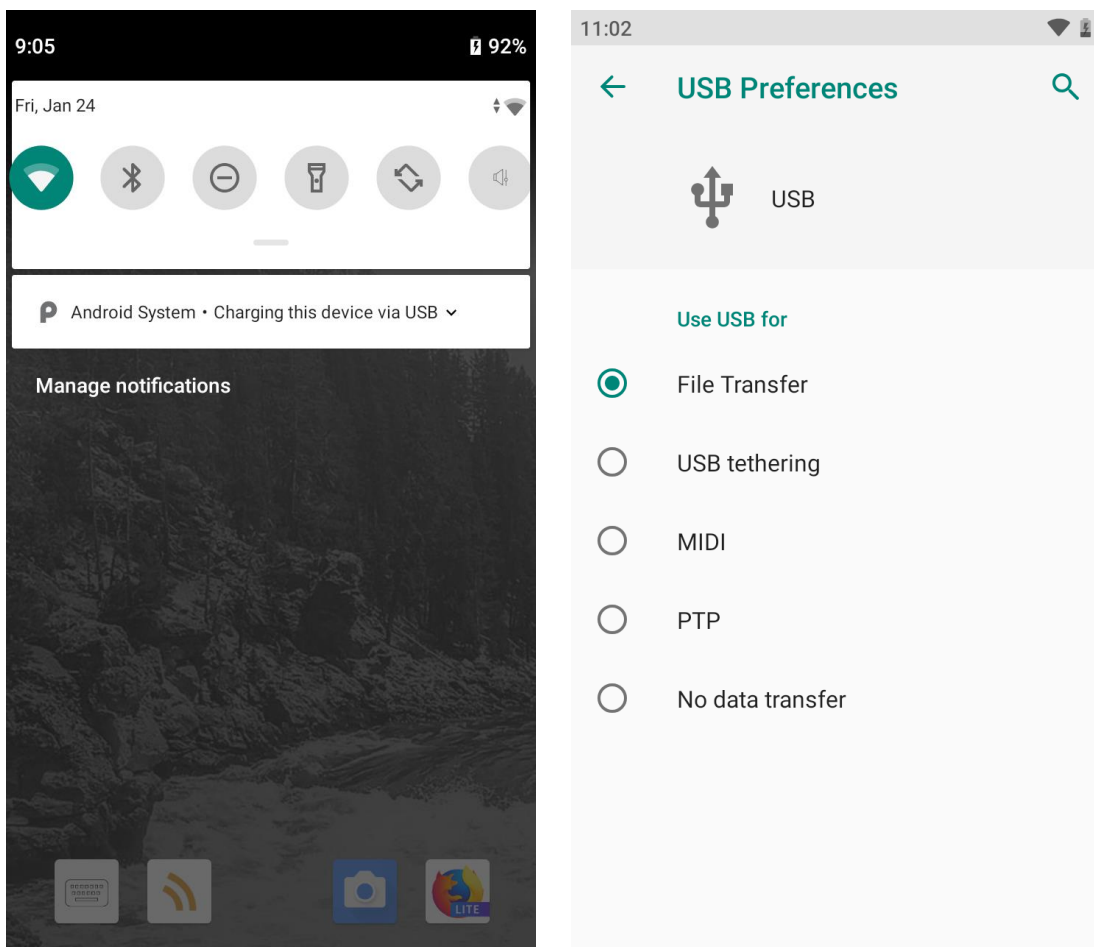
Screenshot 7

3. You will now be warned about unknown apps, potential attacks and app permissions requests. Please make sure that you are installing a safe and known app before accepting both prompts.

Your phone and personal data are more vulnerable to attack by unknown apps. By installing this app, you agree that you are responsible for any damage to your phone or loss of data that may result from its use.

CANCEL   CONTINUE

CANCEL   NEXT

Do you want to install this application? It does not require any special access.

CANCEL   INSTALL

Screenshot 8

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4.3.   LOCKING THE USER INTERFACE

Also known as "kiosk mode", this feature is useful to prevent the user to modify certain settings and install/uninstall applications in Nordic ID HH83/HH85.

When the user interface is locked, the user cannot:

- Install additional applications.
- Uninstall existing applications.
- Add or remove app icons from the home screen.
- Access settings not available in the quick settings dropdown menu.
- Open the applications drawer.
- Update the OS.

The locking is secured using a PIN code, which is decided by the administrator of the device.

4.3.1. CREATE THE DESIRED USER INTERFACE

The first step before locking the user interface is creating the interface which the user will interact with, as any application or setting not included now will not be accessible to the user after locking UI. Please remember that you can have more than one screen and that locking the UI will lock all of them.

1. Install all the applications which the user should have access to, and create shortcut icons on the home screen for all of them.

2. Edit the Quick Settings Dropdown menu, if the user will be allowed to enable, disable or modify the configuration of each one of those settings, e.g., Wi-Fi, Bluetooth, Battery profile,... You can edit the menu by taping the pencil in the bottom right corner.
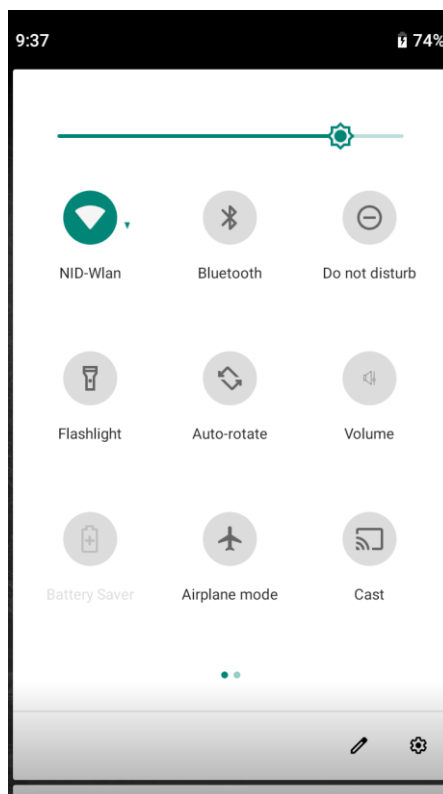
Screenshot 9

3. Select the wallpaper and add any widget which should be visible the home screen. You can configure this by long tapping the home screen background and selection the appropiate option in the pop up menu.

4. If any specific Setting has to be accessible to the user, "Settings shortcut" widgets can also be added, providing a direct access to certain settings such as Battery, Display, Hotspot, Updates, Wi-Fi, Connected devices and many others.
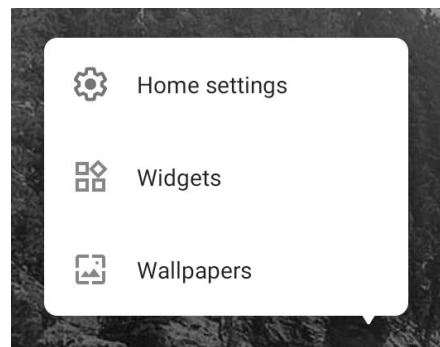
4.3.2. HOW TO LOCK/UNLOCK UI

Once the user interface has been created, it can be locked by long tapping the background and selecting *"Lock user interface"* in *"Home settings"*.
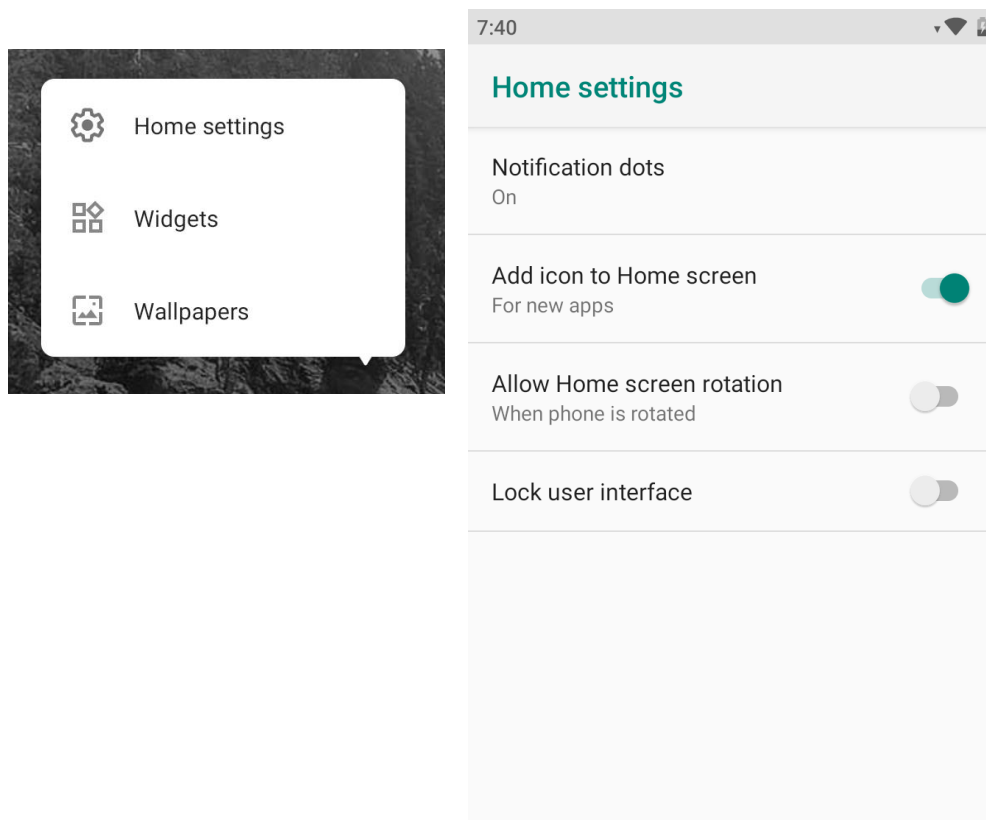
Screenshot 10

You will be prompted to create a PIN code which will be used to unlock the UI in case it is needed.

The process to unlock the user interface is the same: long tapping the background and unchecking the *"Lock user interface"* option.

After the first locking, the device will remember the previous used PIN code and entering it again is not required, unless you want to change it.

4.4. UPDATE INSTRUCTIONS

Android OS and Nordic ID HH83/HH85 drivers/firmware can be updated by following these steps:

1. Connect to the Internet using WLAN, LTE or the desktop cradle with Ethernet adapter.

2. Open Settings menu (Android menu, not Nordic ID RFID Demo settings).

3. Select "System" → "Advanced" and tap "Additional system updates"

4. Then tap the circular refresh arrow on top right to check for an available update and download it from the Internet.

Instead of manual checking, you can also enable an automatic update checking every day, week, 2 weeks or month.
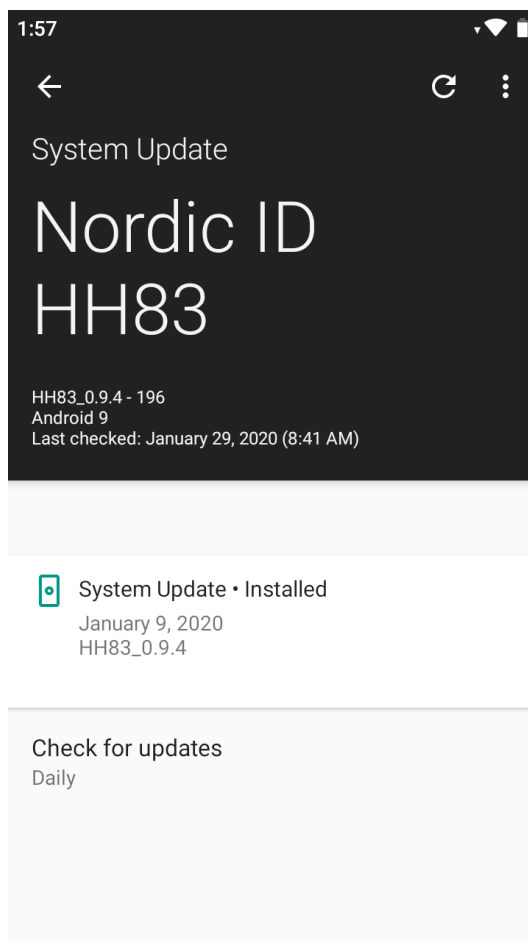
Screenshot 11

You can also subscribe to Nordic ID RSS downloads feed to get notifications about new updates without having a Nordic ID HH83/HH85 on hand:

https://www.nordicid.com/feed/newdownloads/

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4.5.   BACKUP AND RESTORE CONFIGURATION

The settings in the Nordic ID HH83/HH85 can be exported to a file, which can later be imported in the same or another Nordic ID HH83/HH85 unit to apply the same settings. This enables an easy mass configuration and roll out of Nordic ID HH83/HH85 devices.
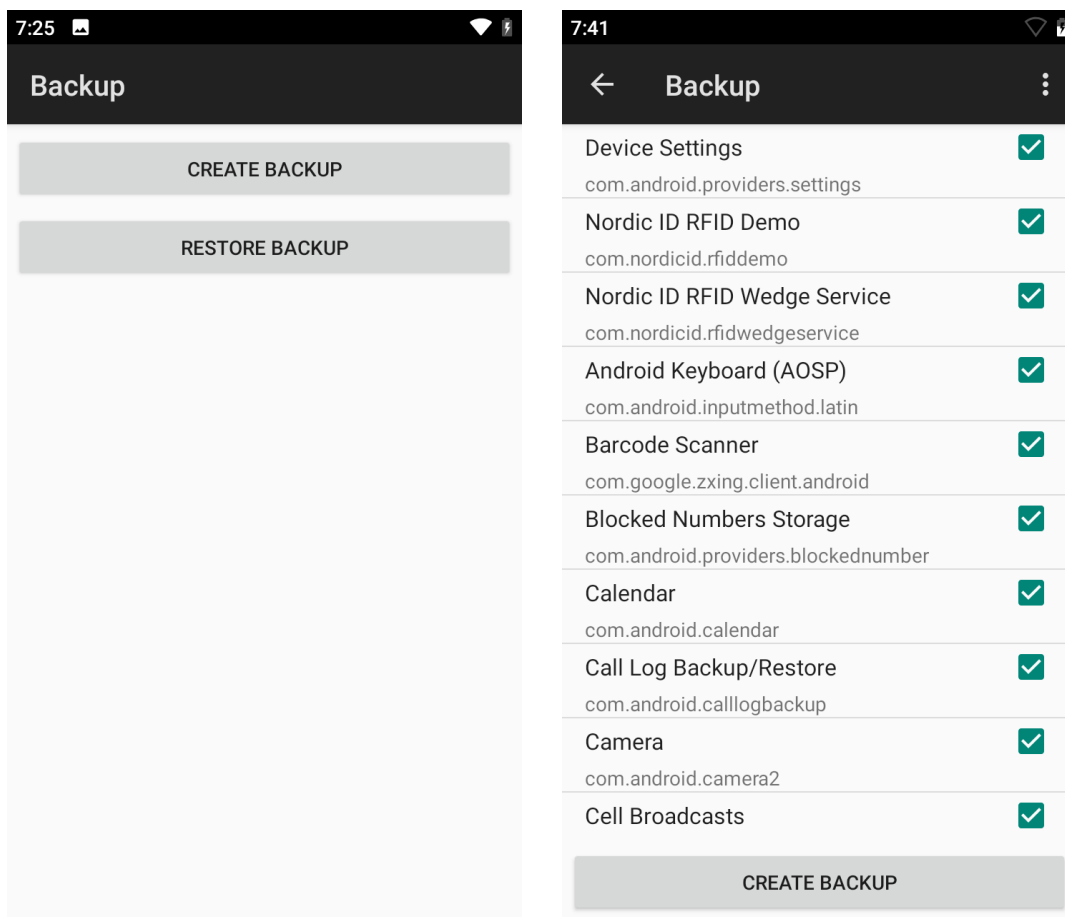
4.5.1. CREATE BACKUP

In order to create a configuration backup, please go to

Settings → System (Advanced) → Backup → Create Backup

These settings include e.,g. home screen shortcuts and widgets, WLAN configuration, apps settings.

> **NOTE!** The backup does not include any installed app or files

Screenshot 12

4.5.2. MANUALLY RESTORE BACKUP

To restore a configuration backup, please go to

Settings → System (Advanced) → Backup → Restore Backup

and select the backup file to restore.

4.5.3. AUTOMATICALLY RESTORE BACKUP WITH USB DRIVE

The configuration can also be restored without using the Android user interface, just using a USB flash drive.

If the backup file is renamed to *"auto_restore_backup"* and saved in the root folder of a USB flash drive, the restore process will start automatically when the USB drive is plugged to a (powered on) Nordic ID HH83/HH85 device.

4.5.4. AUTOMATICALLY RESTORE BACKUP WITHOUT USB DRIVE

In Nordic ID HH83/HH85 devices which have never used the backup/restore option, the *"auto_restore_backup"* backup file can be saved in the Downloads folder, and the restore process will start automatically when the device boots.

4.5.5. SOFTWARE TRIGGERED RESTORE BACKUP

Any custom software can start the restore process by sending the ACTION_MEDIA_SCANNER_SCAN_FILE action to the configuration backup file.

This enables control to software developers to restore the settings on request and even to select which settings to restore, provided that several configuration backup files have been created.

4.6. FACTORY RESET

4.6.1. USING ANDROID MENU

To reset the device to factory settings, please go to

Settings → System → Advanced → Reset options → Erase all data

NOTE! This will return the device to the factory status, i.e., you will lose the configuration, installed apps and files on the device.

4.6.2. WITHOUT USING THE TOUCH SCREEN

If the touchscreen of the device is not responding or the Android OS is stalled, you can also use the physical keys of Nordic ID HH83/HH85 to reset the device:

1. Enter *fastboot mode* by booting the device while pressing the right-side key down.
2. Select "Recovery mode" using the side keys.
3. Press power key to confirm the selection and the device will reboot to "No command" state.
4. Press power key a few seconds and release it to enter the Android Recovery menu.
5. Select "Wipe data/factory reset" using the side keys.
6. Press power key to confirm.

4.7. ENTERPRISE MOBILITY MANAGEMENT (EMM)

The Nordic ID HH83/HH85 supports the Android Enterprise Management framework, which enables using EMM (Enterprise Mobility Management) and MDM (Mobile Device Management) solutions.

These solutions provide an administrator (a person or a company) with remote management features such as device monitoring, device reporting, remote data wiping, mobile application management or access management. In a company-owned deployment scenario, the enterprise owns and fully controls the devices its employees or customers use.

The first step to enroll a Nordic ID HH83/HH85 on an EMM platform is to provision the device, which is a standard procedure in every Android device. You must provision the device owner mode of operation during the initial setup of a new device or after a factory reset. Device owner mode can't be provisioned on a device at any other time.

The provisioning process binds a device to an enterprise and sets a device up for management.

1. Before enrolling a device, the administrator creates an enrollment QR code with a management console or similar application in the EMM platform, using "Work Managed Device" or "Device Owner" management mode. This QR code contains an enrollment token and all the information that is needed for Android Device Policy to provision a device.

2. On a new or factory-reset Nordic ID HH83/HH85 device, the user (typically an IT admin) taps the screen six times in the same spot. This triggers the device to prompt the user to scan a QR code.
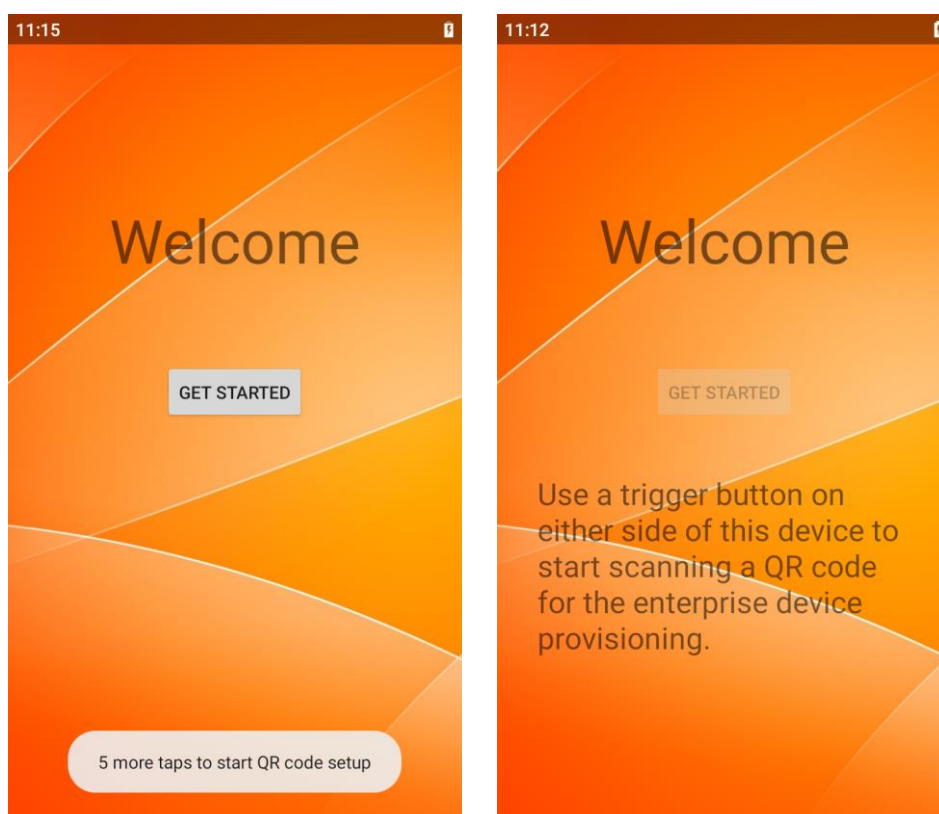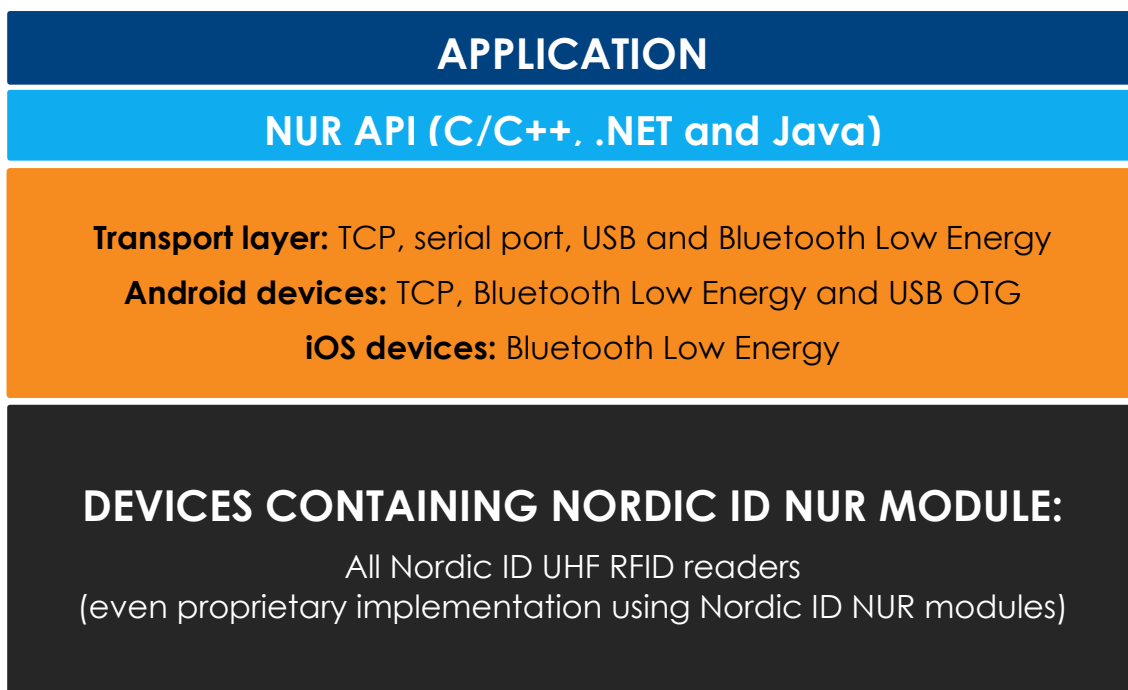

Screenshot 13

3. The user scans the QR code using the barcode scanner (imager).

4. The EMM app will be copied into the managed profile in Nordic ID HH83/HH85 and the user will be able to use it to enroll the device.

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4.8.   APPLICATION DEVELOPMENT

4.8.1. NUR API IN GENERAL

NUR API is an application programming interface for Nordic ID UHF RFID module. It provides control for all Nordic ID UHF RFID readers. The NUR API provides compatibility between Nordic ID UHF RFID reader from RFID functions perspective. The NUR API consists of application, NUR API, transport and HW layers as depicted here:

APPLICATION

NUR API (C/C++, .NET and Java)

Transport layer: TCP, serial port, USB and Bluetooth Low Energy
Android devices: TCP, Bluetooth Low Energy and USB OTG
iOS devices: Bluetooth Low Energy

DEVICES CONTAINING NORDIC ID NUR MODULE:
All Nordic ID UHF RFID readers
(even proprietary implementation using Nordic ID NUR modules)

Picture 20 NUR API architecture

4.8.2. APPLICATION DEVELOPMENT

Nordic ID provides Software Development Kits (SDK) and code samples via GitHub. More information including source code and samples can be found from GitHub via following link:

Android

https://github.com/NordicID/nur_nurapi_android

https://github.com/NordicID/nur_nurapi_android

https://github.com/NordicID/nur_tools_rfiddemo_android

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5. REGIONAL SETTINGS

Nordic ID UHF RFID readers do support operating frequency range between 860 - 960MHz. Some of the readers do cover full operating frequency band and some of them have two sub bands that are 868 ETSI band (865.6 - 867.6 MHz) and 915 FCC band (902 - 928 MHz). Regional organizations as ETSI and FCC have set rules and requirements for operating frequencies, output power and other RF parameters for the UHF RFID readers to comply local regional requirements.

Nordic ID has created set of regional settings in order to fulfill local regulations. Nordic ID is required to ensure compliance of Nordic ID products will remain after production. Solution for this is products including UHF RFID functionality will be set and locked in production based on customer order e.g. if a product is ordered to Europe, it will be locked to ETSI region. And for example, if a product is ordered to Australia region, then it's locked to Australia region. When a product is locked to individual region, it will comply local regulations of the region.

6. COMPLIANCE STATEMENTS

6.1. CE

Hereby, Nordic ID Oyj declares that this device is in compliance with the essential requirements and other relevant provisions of:

- RED: 2014/53/EU

- EMC: 2014/30/EU

- LVD: 2014/35/EU

- RoHS: 2011/65/EU

6.2. FCC/IC

The Nordic ID HH83 RFID ACD device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

WARNING: Changes or modifications not expressively approved by the party responsible for compliance could void the user's authority to operate the equipment.

The Nordic ID HH83 RFID ACD device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

(1) This device may not cause interference.

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le resent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1) L'appareil ne doit pas produire de brouillage;

2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

6.3. RF EXPOSURE

This equipment complies with EU, FCC and IC's RF radiation exposure limits set forth for an uncontrolled environment under the following conditions:

The Nordic ID HH83 RFID ACD device should be installed and operated such that a minimum separation distance of 20mm is maintained between the antenna and user's/nearby person's body at all times.

Nordic ID HH83 RFID ACD doit être installé et utilisé de manière à ce qu'une distance de séparation minimale de 20 mm soit maintenue à tout moment entre l'antenne et le corps de l'utilisateur / de la personne proche.

7. SERVICE AND SUPPORT

For technical enquiries regarding Nordic ID devices or software development, please contact our Technical Support:

E-mail: support@nordicid.com
Telephone: +358 2 727 7790

As a manufacturer, Nordic ID stands responsible for providing repair services for its devices during and after the warranty period. Together with partners Nordic ID serves customers globally. When your Nordic ID device needs repair, always use only our Nordic ID Service or our authorized service partners. We want to make sure that your Nordic ID product serves you the best possible way, and by using our preferred service partners the quality of the service is trustworthy and the spare parts are original. This way the existing product warranty remains, and you receive a 3-month service warranty for the repaired devices.

Nordic ID works together with full support and primary support partners. Full support partners can handle both warranty and non-warranty repairs on behalf of Nordic ID in their own regions. In addition, Nordic ID has a network of smaller repair centres, primary support partners, who offer the first line of support to their customers locally.

For any enquiries about Nordic ID repair service please contact:

E-mail: service@nordicid.com
Telephone: +358 2 727 7791

8. WARRANTY

Nordic ID warrants that the Products are at the time of delivery free from defects in materials and workmanship, provided the Products remain unmodified and are operated under normal and proper conditions. **Warranty period is the longer of twenty-four (24) months** from the date of delivery in case the Customer is end-customer or twenty-seven (27) months from the date of manufacture in case the Customer is reseller. Spare parts are warranted against defects in workmanship and materials for a period of ninety (90) days from the date of delivery to Customer.

For more detailed information about the warranty can be found from Nordic ID Sales Terms.

9. RELATED DOCUMENTS AND CONTENT

- Nordic ID HH83 datasheet
- Nordic ID HH83 Quick Guide
- Nordic ID Safety and Regulations Guide
- Nordic ID GitHub account for developers (https://github.com/NordicID)

10. ABOUT NORDIC ID

Nordic ID is at the centre of today's real-time item tracking and reliable RFID technology. We help organizations fight the damaging effects of item loss, facilitate streamlined business procedures, and stay ahead of the competition.

We are ready to help you take advantage of our wide range of products and services designed to fit your needs. Contact us now, and we will help you to tackle your challenges and get your business to the next level.

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11.   VERSION HISTORY

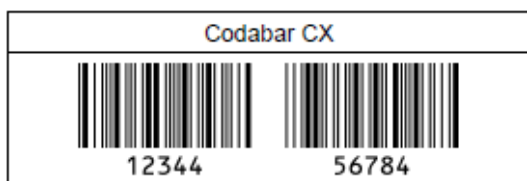| Version	Date	Modifications
1.0	22.08.2019	The first version
1.1	31.01.2020	Added Android screenshots, desktop charger description, ToF sensor, volume, backup option, new pictures
1.2	30.04.2020	Lock User Interface, pictures of accessories, compliance statements
1.3	18.05.2020	Nordic ID HH85, new backup restore modes, EMM support, Nordic ID App Center
1.4	20.04.2021	Factory reset, Asian variants, more details on EMM and App Center

12. APPENDICES

12.1. APPENDIX 1 SAMPLE 2D IMAGER CONFIGURATION BARCODES

NOTE! Barcode configuration codes can be read only when there is no active Bluetooth connection with the host device

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