Brady HH86

UHF RFID READER

User Manual

Copyright and Trademarks

Disclaimer

This manual is proprietary to Brady Worldwide, Inc. (hereafter “Brady”), and may be revised from time to time without notice. Brady disclaims any understanding to provide you with such revisions, if any.

This manual is copyrighted with all rights reserved. No portion of this manual may be copied or reproduced by any means without the prior written consent of Brady.

While every precaution has been taken in the preparation of this document, Brady assumes no liability to any party for any loss or damage caused by errors or omissions or by statements resulting from negligence, accident, or any other cause. Brady further assumes no liability arising out of the application or use of any product or system described, herein; nor any liability for incidental or consequential damages arising from the use of this document. Brady disclaims all warranties of merchantability of fitness for a particular purpose.

Brady reserves the right to make changes without further notice to any product or system described herein to improve reliability, function, or design.

Trademarks

Product Name is a trademark of Brady Worldwide, Inc.

Microsoft, Windows, Excel, Access and SQL Server are registered trademarks of Microsoft Corporation.

Bluetooth and the Bluetooth logo are trademarks of Bluetooth SIG, Inc. Wi-Fi is a trademark of Wi-Fi Alliance®.

Apple is a trademark of Apple Inc.

Google Play is a trademark of Google LLC.

All brand or product names referenced in this manual are trademarks (™) or registered trademarks (®) of their respective companies or organizations.

Brady Worldwide, Inc.
6555 West Good Hope Road
Milwaukee, WI 53223
bradyid.com

Brady Warranty

Our products are sold with the understanding that the buyer will test them in actual use and determine for themself the adaptability to their intended uses. Brady warrants to the buyer that its products are free from defects in material and workmanship, but limits its obligation under this warranty to replacement of the product shown to Brady's satisfaction to have been defective at the time Brady sold it. This warranty does not extend to any persons obtaining the product from the buyer.

THIS WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND OF ANY OTHER OBLIGATIONS OR LIABILITY ON BRADY'S PART. UNDER NO CIRCUMSTANCES WILL BRADY BE LIABLE FOR ANY LOSS, DAMAGE, EXPENSE OR CONSEQUENTIAL DAMAGES OF ANY KIND ARISING IN CONNECTION WITH THE USE, OR INABILITY TO USE, BRADY'S PRODUCTS.

Safety and Environment

Please read and understand this manual before using the HH86 RFID reader for the first time. This manual describes all of the main functions of the HH86 RFID reader.

Precautions

Before using the HH86 RFID reader, please note the following precautions:

- Read all instructions carefully before operating the RFID reader and prior to performing any procedure.
- Do not place the unit on an unstable surface or stand.
- Do not place anything on top of the unit.
- Only use the power source indicated on the rating label.
- This equipment is not intended for use by children.

CAUTION!

To avoid unnecessary exposure to RF radiation:

- Operate the Brady HH86 only by holding it by the pistol grip.
- Do not point the Brady HH86 at yourself or others during operation.

Technical Support and Registration

Contact Information

Visit the Brady Knowledge Base at support.bradyid.com/s/.

For repair or technical assistance, locate your regional Brady Technical Support office by going to:

- **United States:** bradyid.com/techsupport
- **Canada:** bradycanada.ca/contact-us
- **Mexico:** bradyid.com.mx/es-mx/contacto
- **Latin America:** bradylatinamerica.com/es-mx/soporte-técnico
- **Europe**: bradyeurope.com/services
- **Australia:** bradyid.com.au/technical-support
- **Asia Pacific**: brady.co.uk/landing-pages/global-landing-page

Repair and Return

If for any reason you need to return the product for repair, please contact Brady Technical Support for repair and replacement information.

As a manufacturer, Brady stands responsible for providing repair services for its devices during and after the warranty period. Together with partners Brady serves customers globally. When your Brady device needs repair, always use only Brady Service or our authorized service partners. We want to make sure that your Brady 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.

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

Document Conventions

When using this document, it is important that you understand the conventions used throughout the manual.

- All user actions are indicated by **Bold** text.
- References to menus, windows, buttons and screens are indicated by *Italicized* text.

Contents

1 Getting Started

The Brady HH86 is designed for quick, accurate and reliable data collection, whether for barcode or UHF RFID reading. It features the Android 13 operating system (upgradable to Android 14) and ample processing power, enabling sophisticated software development and a superb user experience. The 4.7" HD touchscreen with Gorilla Glass 3 provides excellent display quality and robustness.

What makes the Brady HH86 so powerful and an ideal contemporary data collection tool is the NUR3-1W module developed by Nordic ID, delivering state-of-the-art UHF RFID reading performance.

Device Variants

The Brady HH86 is available in multiple variants. All variants are equipped with a 2D imager (barcode reader), WLAN interface, Bluetooth support, rear camera and NFC reader.

CODE	FREQUENCY	4G LTE	DESCRIPTION
HTI00001-EU	868 MHz	No	Brady HH86 Reader UHF 868 2DImg EU
HTI00002-EU	868 MHz	Yes	Brady HH86 Reader UHF 868 2DImg LTE EU
HTI00003-US	915 MHz	No	Brady HH86 Reader UHF 915 2DImg US
HTI00003-EU2	915 MHz	No	Brady HH86 Reader UHF 915 2DImg EU2
HTI00005-EU2	915 MHz	Yes	Brady HH86 Reader UHF 915 2DImg LTE EU2

Figure 2-1. Brady HH86 device

Accessories

Chargers and other connection accessories are available for the Brady HH86.

Desktop chargers are powered via an external AC power supply, included in the desktop charger package. Make sure you select the plug appropriate for your region (EU, UK, or US).

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
ACN00260	Brady HH86 Battery 10050mAh with pistol grip cover
ACN00262	Wall Adapter QuickCharge PD 18W USB-C kit, EU UK US

Note: With a 4-bay desktop charger, you need a USB-C to Ethernet adapter for each charging bay you want to connect to Ethernet (up to four).

Figure 2-2. Brady HH83 single and 4-bay desktop chargers

Figure 2-3. USB Type-C to Ethernet adapter

Figure 2-4. Wall Adapter QuickCharge PD 18W USB-C kit

Figure 2-5. Brady HH86 battery with pistol grip cover

In-Box Content

The Brady HH86 box contains the following items:

- Brady HH86 device
- Removable 10050mAh battery with pistol grip (pre-installed on the unit).
- Wrist strap
- Safety and regulations card

Features

Figure 2-6. Brady HH86 features (front)

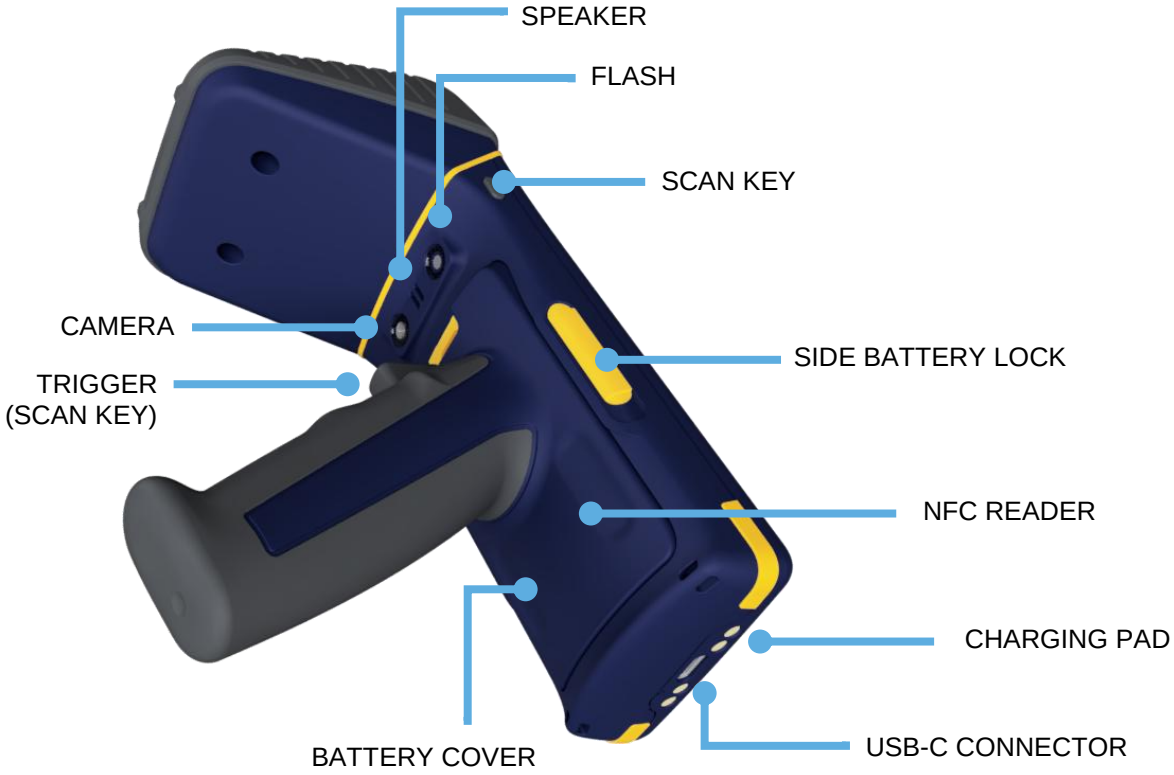

Figure 2-7. Brady HH86 features (back)

Figure 2-8. Brady HH86 features (top)

Charging the Device

The Brady HH86 can be charged through its USB-C port or a Brady HH83 desktop charger. If you use a USB charger, it must have a USB-C connector and preferably support for Quick Charge 3.0.

The charging time from 0 to 80% is about 4 hours, and to 100% about 6 hours.

Note: For regulatory reasons, the device is delivered with an empty battery. Fully charge the battery before you switch on the Brady HH86 for the first time.

While the Brady HH86 is connected to a charger, the status LED on the device indicates charging progress:

Red	Battery level below 15%
Yellow	Battery level between 15% and 90%
Green	Battery level above 90%

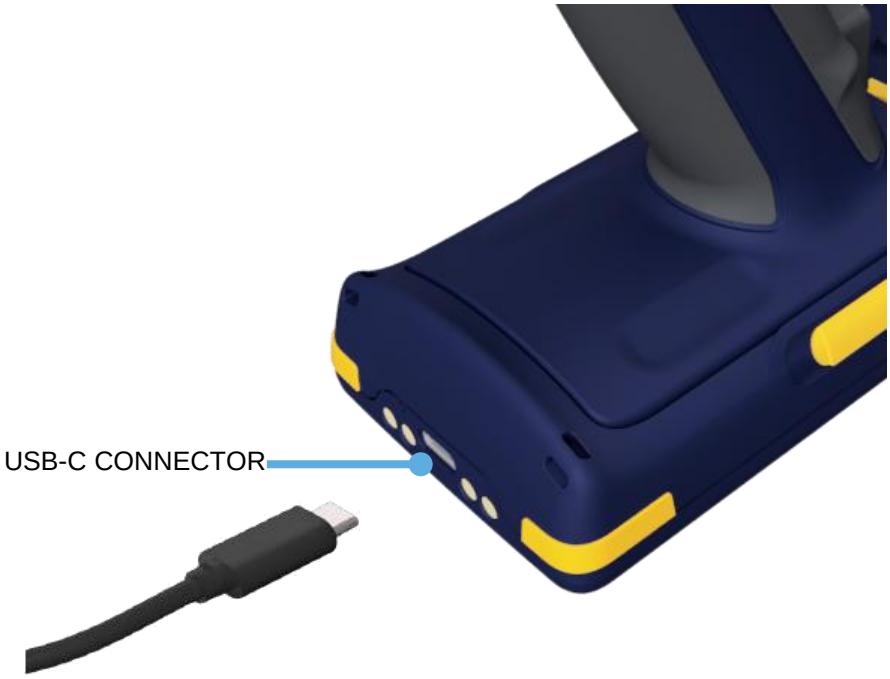

Figure 2-9. USB-C charging

Note: USB-C wall adapters and desktop chargers are sold separately.

Battery Pack

To remove the battery pack from the Brady HH86, slide the yellow battery locks (one on each side) and the yellow latch at the top of the battery pack toward the bottom of the device, then tilt the battery pack backward to remove it from its compartment.

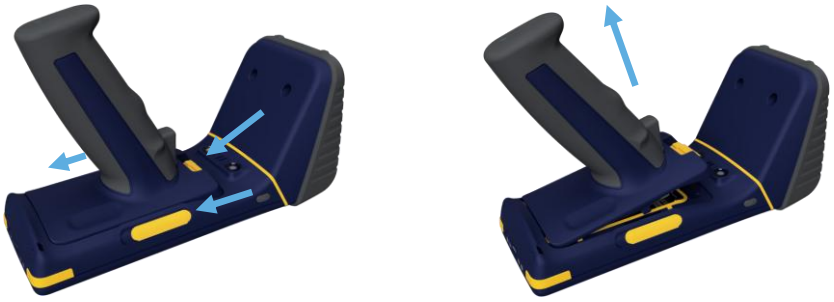

Figure 2-10. Battery pack removal

To install the battery pack, reverse the steps. Make sure the battery locks and latch are secure before switching on or charging the device.

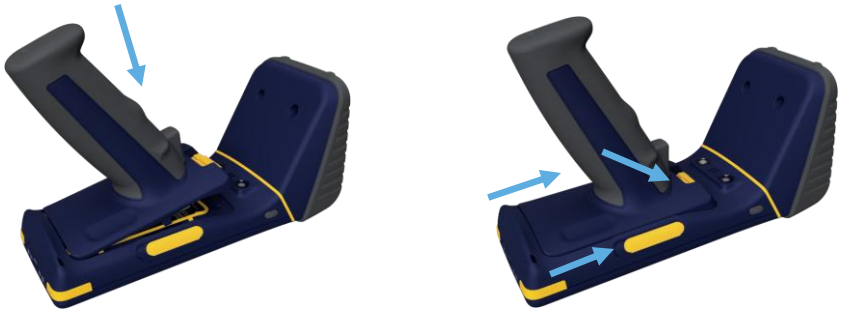

Figure 2-11. Battery pack installation

Desktop Charger

Each bay of the Brady HH83 Desktop Charger can accommodate either a Brady HH86 unit or a spare battery for it. With the Brady HH83 4-Bay Desktop Charger, you can fill the bays with four devices and batteries in any combination, for example two devices and two batteries, or one device and three batteries.

Note: A Brady HH86 unit and a spare battery with pistol grip cover cannot be charged simultaneously in the same bay of a desktop charger.

Figure 2-12. Brady HH83 Desktop Charger (single bay)

The USB-C port allows you to connect the Brady HH86 device to a host device (such as a computer) via USB or to Ethernet with a USB-C to Ethernet adapter.

IMPORTANT! The USB-C port on the desktop charger is for data connection only. It is not intended for charging.

The LEDs on each charging bay indicate whether and how a Brady HH86 device or spare battery is connected to it.

Power status LED

Green	Desktop charger connected to power

Communication mode LED

Green	Brady HH86 in cradle connected to host via USB
Blue	Brady HH86 in cradle connected to Ethernet via USB adapter

Battery status LED

Red	Spare battery being charged
Green	Spare battery fully charged

Installing SIM and Memory Cards

The storage capacity of the Brady HH86 can be expanded with a micro-SD card. On the LTG/4G variant, you can also enable mobile data communication by installing a micro-SIM card.

To access the card slots, remove the battery as shown on page 8.

Figure 2-13. Micro-SD and micro-SIM slots

Note: The micro-SIM slot is functional on the Brady HH86 LTE/4G variants only.

2 Using the Device

This chapter describes the physical buttons, commonly-used settings, and sensors on the Brady HH86.

Physical Keys (Buttons)

The Brady HH86 has various physical keys for user interactions, as illustrated on page 5.

Scan and Trigger Keys

The Brady HH86 has a Scan key on each side, allowing the device to be used with either hand. It also has a trigger key on the pistol grip, which also behaves as a Scan key.

In Brady applications, such as Brady RFID Demo or Brady RADEA Mobile Client, the default behavior for these keys is to start and stop UHF RFID and/or barcode reading.

Software developers can customize the behavior of the Scan and trigger keys via the Android API.

Note: By default, when the Brady HH86 is in sleep mode, the side buttons do not wake the device.

For best scanning performance, grip the Brady HH86 reader comfortably in the hand and orient the device with the forward module parallel to the barcode or tag.

Figure 2-1. Handheld orientation for scanning barcodes and RFID tags

Power Key

The Power key switches the device on and off:

- If the device is in sleep mode, pressing the Power key wakes it.
- To display the “Power off” menu, press and hold the Power key until the menu appears.
- To force the device to reboot, press and hold the Power key for 8 seconds.

Home, Back, and Apps Keys

The Home, Back, and Apps keys behave in the same way as the on-screen buttons in Android OS:

- Home key moves you to the Home screen without closing the application.
- Back key returns you to the previous screen in any application or closes the application if you are on its main screen.
- Apps key opens the Android task manager view, where you can manage the apps that are currently open.

Quick Settings

The Quick Settings panel allows you to conveniently access commonly used settings, including adjusting the device volume and enabling the Wedge service. To open the Quick Settings panel, swipe down on the screen.

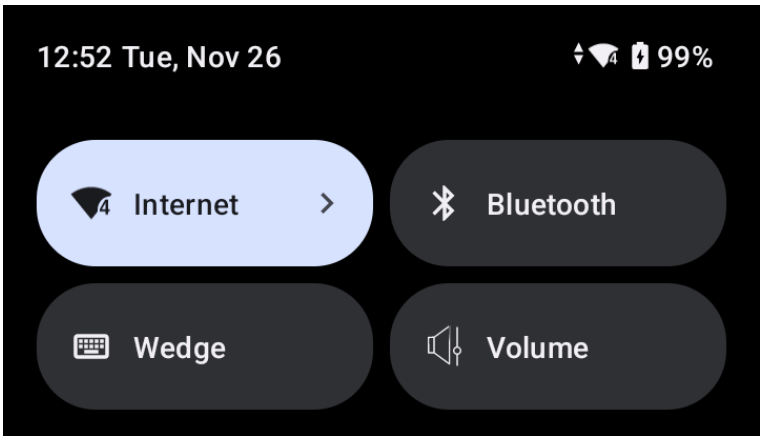

Figure 2-2. Quick Settings panel

To view more Quick Settings shortcuts, swipe down on the screen again, then swipe across to browse the available shortcuts.

Device Volume

The Brady HH86 has a speaker and an earpiece. You can control their volume in the same way as on most devices that run Android OS. However, because the Brady HH86 does not have physical volume control buttons, you must use the shortcut in the Quick Settings panel.

Wedge Service

The Wedge service is integrated into the operating system on the Brady HH86. It enables the device to take the information that it reads from RFID tags and barcodes and transform it into text output.

To enable or disable the Wedge service, tap **Wedge** in the Quick Settings panel. You can also access the Wedge settings by pressing and holding this **Wedge** button.

Sensors and Antennas

The Brady HH86 is equipped with several sensors and antennas, as illustrated on page 5.

Light and Proximity Sensors

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

If adaptive display brightness is enabled, the light sensor is used to adjust the brightness of the screen based on the ambient light.

The proximity sensor detects when you have the phone up to your ear, to prevent accidental taps on the touchscreen.

NFC Reader

An NFC antenna is located on the back of the Brady HH86. It supports various proximity and vicinity NFC modes and is compatible with most existing Android apps that use NFC features.

Supported NFC modes include:

- ISO/IEC A and B
- FeliCa
- MIFARE 1K and 4K
- NFC Forum types 1, 2, 3, 4, and 5
- ISO/IEC 15693

To test this feature, you can use the Brady RFID Demo app to read NFC tags and retrieve basic information from them.

Figure 2-3. NFC antenna location

Barcode Scanner

The Brady HH86 is equipped with an Opticon MDI-5300 2D imager module, which enables the device to read a wide range of 1D and 2D barcode formats.

For information on configuring the 2D imager to read specific barcode formats, see page 25.

RFID Reader

The Brady HH86 includes the NUR3-1W UHF RFID module, which supports several RF profiles.

In the Brady RFID Demo app, select Settings > RFID. Select an appropriate RF profile based on your use case and environment:

CODE	DESCRIPTION
Robust	• Link frequency: 160 kHz • Coding: Miller 8 • Read rate: Up to 50 tags/s Optimized for sensitivity through slower data speed. Ideal for challenging environments where there can be interfering signals from other readers, signal sources, or reflections from the environment.
Nominal	• Link frequency: 250/300 kHz • Coding: Miller 4 • Read rate: Up to 250 tags/s The default profile for the Brady HH86. This profile is recommended for DRM use cases.
Fast	• Link frequency: 640 kHz • Coding: Miller 4 • Read rate: Up to 500 tags/s Provides a balance between speed and sensitivity.
High speed	• Link frequency: 640 kHz • Coding: FM0 • Read rate: Up to 900 tags/s Optimized for speed at the cost of high sensitivity. Good for environments where little interference is expected.
High speed 2	• Link frequency: 640 kHz • Coding: FM0 • Read rate: Up to 1000 tags/s or more The High speed 2 profile further optimizes for speed by reducing the Tari value for the pulse interval encoded (PIE) data.

Note: The actual read rate depends on factors such as the operating environment, reader settings, tag population, and tag type.

UHF RFID Antenna

The Brady HH86 has an integrated UHF RFID antenna. The antenna has circular polarization, which means that the Brady HH86 can read tags in any orientation (vertical, horizontal, or mixed). The nominal reading distance is up to approximately 10 m / 33 ft. The actual reading range depends on the tag and the operating environment.

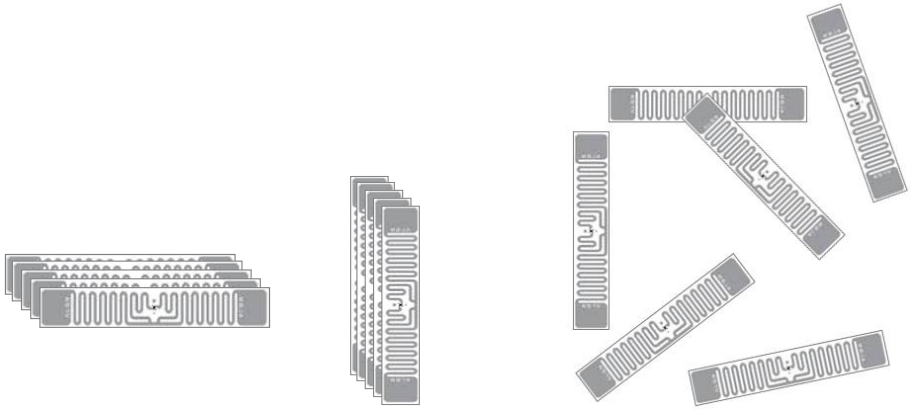

Figure 2-4. RFID tags in horizontal, vertical, and mixed orientation

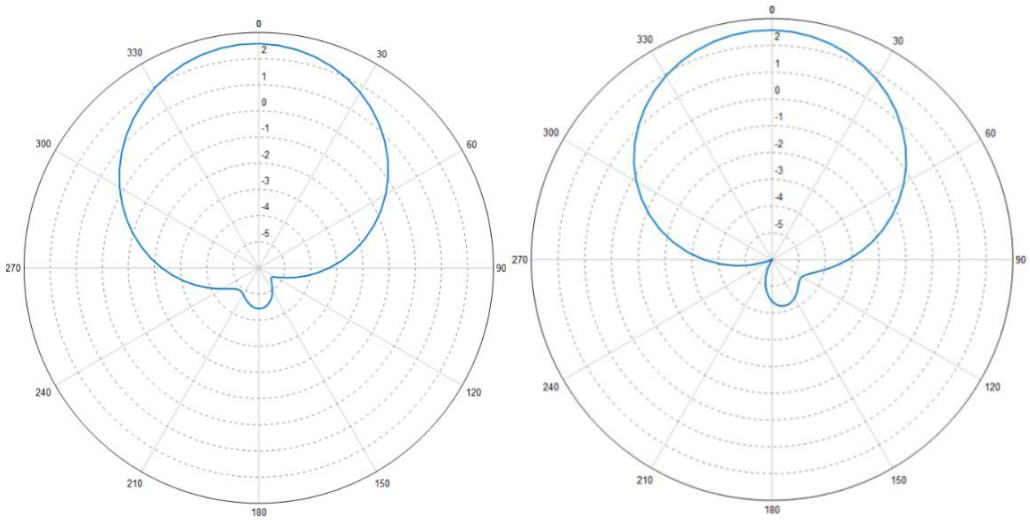

Figure 2-5. Internal antenna radiation pattern

UHF RFID SPECIFICATION	VALUE
Frequency	ETSI 865.6-867.6 MHz or FCC/IC 902-928 MHz
Maximum gain	+2.5 dBic
3 dB Beam width	125°
Front-to-back ratio	7 dB
Axial ratio	<2 dB
Maximum input power	2 W

3 Software

In addition to the features provided by applications pre-installed on the Brady HH86, you can customize the device software for your use case with third-party applications.

Pre-Installed Brady Applications

The Brady HH86 comes with easy-to-use applications pre-installed on it. You can access them from the applications drawer by swiping up on the Home screen. These applications allow you to quickly start evaluating and using the device.

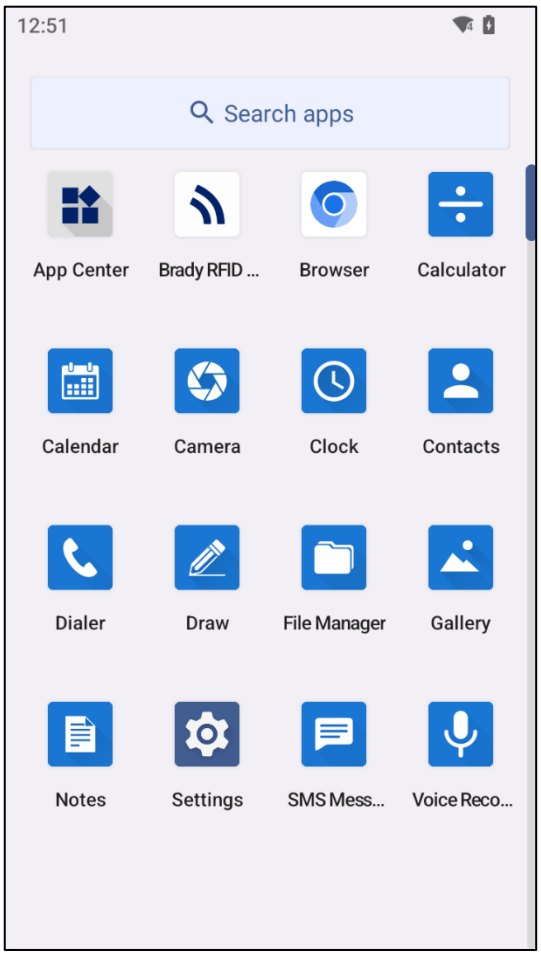

Figure 3-1. Applications drawer

Brady RFID Demo for Android

The Brady RFID Demo app for Android is a full-featured application that provides access to various RFID reader features on the Brady HH86.

You can use the Brady RFID Demo app to test the capabilities of compatible Brady devices and how RFID settings affect tag reading performance. It also allows you to manage the device settings and install firmware.

The Brady RFID Demo app includes the following key features:

- Perform RFID inventory (EPC, TID and user memory)
- Locate an RFID tag with a specific EPC
- Write RFID tags
- Read NFC tags
- Scan barcodes
- Update device firmware

To move between Settings screens or to view the EPC list during an inventory session, swipe across the application screen.

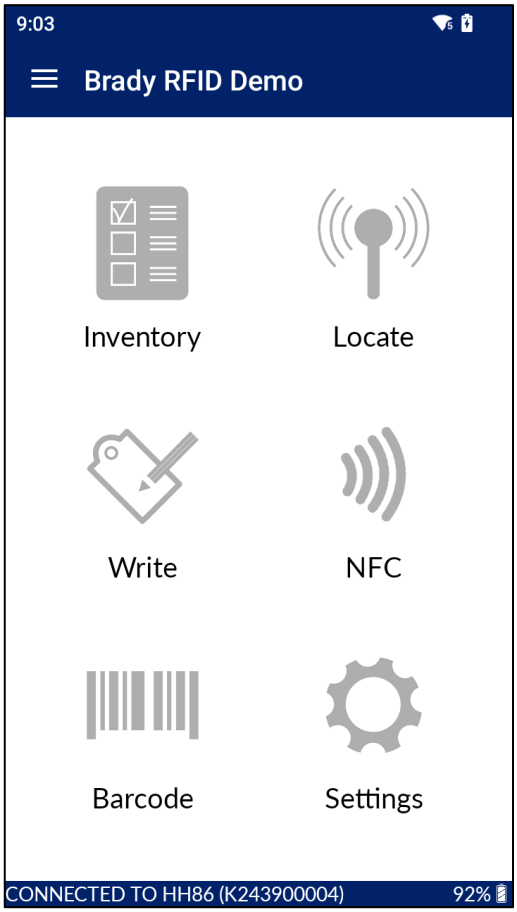

Figure 3-2. Brady RFID Demo main screen

Brady App Center

Since the Brady HH86 is designed for use in business and industrial settings, it uses an implementation of Android OS that omits the GMS (Google Mobile Services) module normally included on most consumer Android devices. This promotes greater privacy and security of personal and proprietary information by preventing location tracking and data collection.

Consequently, to prevent installing unauthorized third-party applications, the Brady HH86 does not use the Google Play Store and instead comes with the Brady App Center, based on the open-source F-Droid app repository client.

The Brady App Center provides a customizable application catalog through selected repositories, and keeps the applications installed from them updated. The default repositories in the app include:

- Brady App Center, which provides the essential apps for Brady HH86 devices, such as Brady RFID Demo.
- F-Droid repository, a broad and curated catalogue of Open-Source Software, including web browsers, PDF readers, map and navigation apps, among others. The apps in the F-Droid repository have been verified as secure and free of viruses and malware.

You can customize the repositories list in the Brady App Center, enabling users to install additional applications of your choice. For information about creating a custom repository, see “How to Create a Repo” at the F-Droid site (https://f-droid.org/en/tutorials/create-repo/).

Custom repository details are included in configuration backups, so they can be easily copied to another Brady HH86 unit. For information about configuration backups, see page 28.

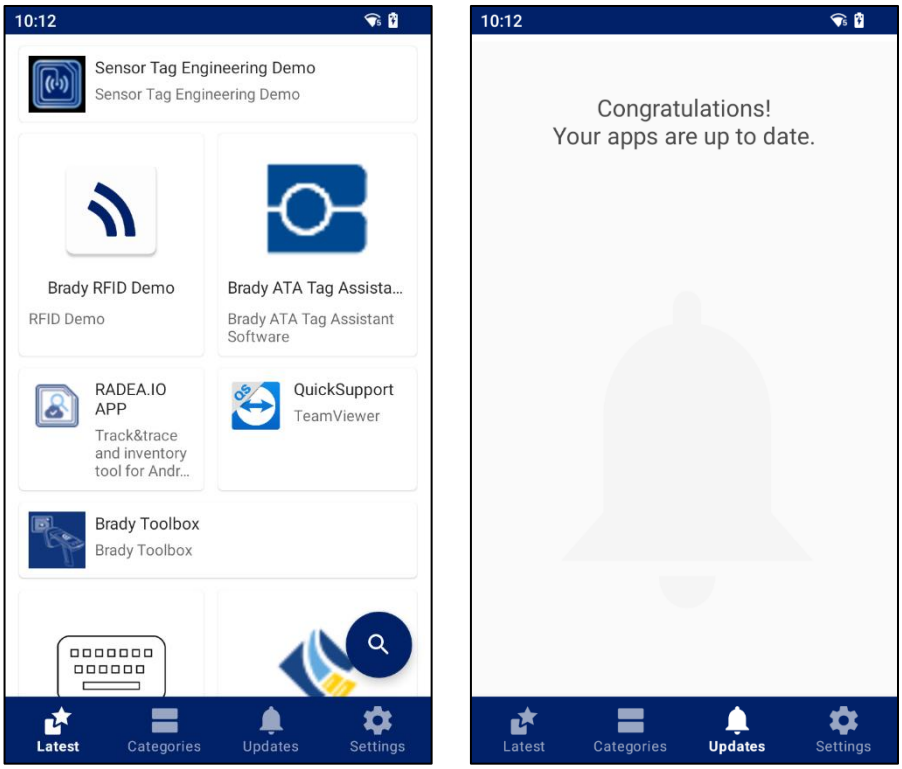

Figure 3-3. Brady App Center

Install Third-Party Applications

You can install third-party Android applications on the Brady HH86 by copying the application package file to the device and launching it.

Make sure that third-party applications are safe before installing them.

To install a third-party Android application on the Brady HH86:

1. Connect the Brady HH86 device to your computer using a USB cable.
2. On the device screen, swipe down to open the notification panel and tap the **Charging this device via USB** notification to expand it.
3. Tap the notification again. The *USB Preferences* screen opens.
4. Select **File Transfer**.

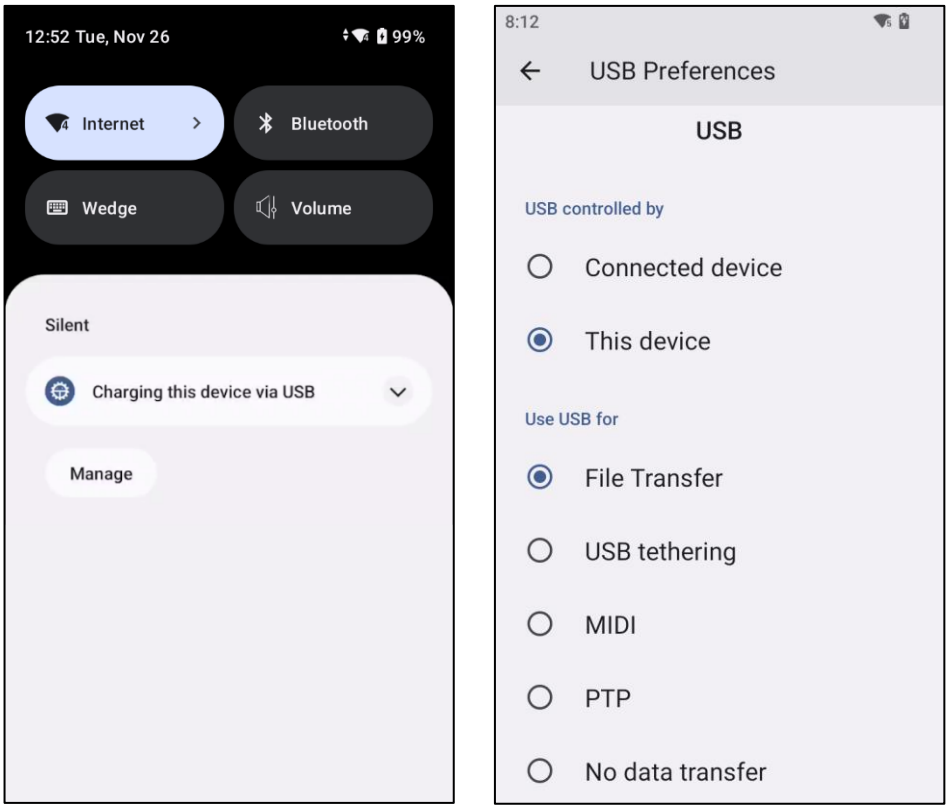

Figure 3-4. USB file transfer

5. On your computer, copy the application APK file to the device.
6. Disconnect the Brady HH86 from your computer.
7. On the device, launch the Files app. Navigate to the APK file and tap it.
8. Acknowledge the security warning and confirm the installation.

Update Software and Firmware

To check for and install updates to the Android OS, drivers, and firmware on the Brady HH86:

1. Connect the device to the Internet through WLAN, LTE, or the desktop charger with Ethernet adapter.
2. In the Settings app, select **System > Additional system updates**.
3. To check for available updates, tap the refresh icon in the top right.
4. If updates are available, tap **Download** and then **Install**.

You can also enable automatic update checks. Tap **Check for updates** and select the frequency that you want.

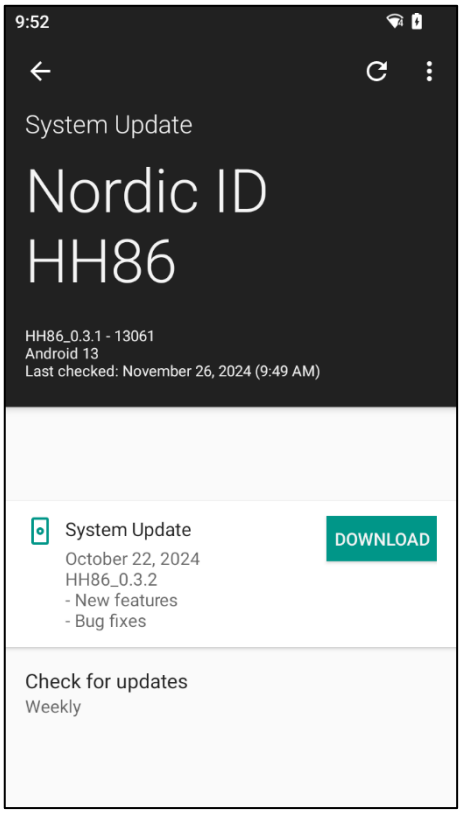

Figure 3-5. System update check

4 Device Management

This chapter describes how to configure the user interface and barcode scanner, as well as how to backup, reset, and set up the device for Enterprise Mobility Management (EMM).

User Interface

You can customize and lock the Brady HH86 user interface to give users access to the apps they need, while preventing them from making unauthorized changes to the device settings.

Customizing the User Interface

To provide easy access to selected applications and features for your users, you can customize the user interface (UI) on the Brady HH86 screen:

- Home screen
  - To select a background image for the screen, long-press on an empty part of the screen and select **Wallpapers**.
  - To create an application shortcut, in the applications drawer, press and hold the application icon and drag it to the desired location on the screen.
  - To create a shortcut to a specific settings menu, long-press on an empty part of the screen and select **Widgets**.

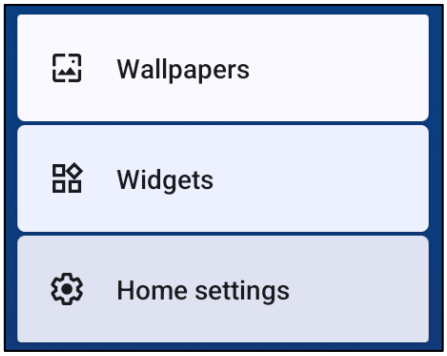

Figure 4-1. Home screen long-press menu

- Quick Settings panel

  The Quick Settings panel allows users to conveniently enable, disable, and access settings for various device features, such as Wi-Fi, Bluetooth, and Volume.

  To customize the Quick Settings panel:

  1. Open the Quick Settings panel by swiping down from the top of the screen.
  2. Expand the panel by swiping down again.

3. To enable editing mode, tap the pencil icon at the bottom right of the panel.
4. To rearrange the Quick Settings tiles, press and drag them.

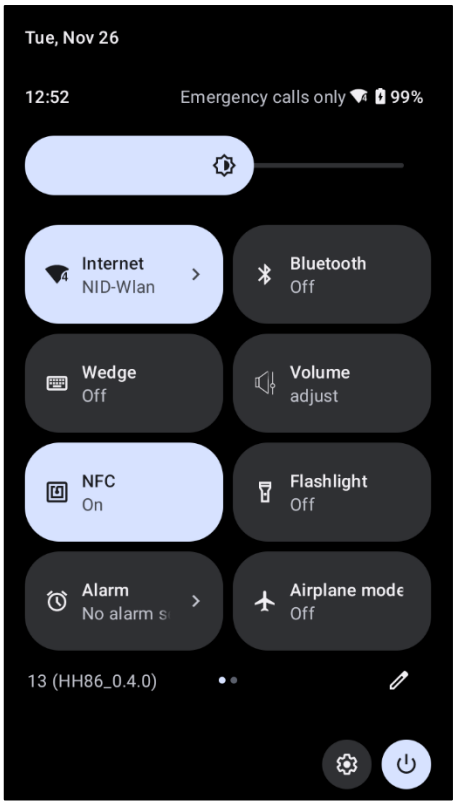

Figure 4-2: Expanded Quick Settings panel

When you have finished customizing the UI, you can enable “kiosk mode” to prevent users from changing it.

Enabling Kiosk Mode

To prevent users from modifying the device settings and applications on the Brady HH86, an administrator can enable kiosk mode, which means to lock the user interface (UI).

In kiosk mode, the user can access only applications and widgets on the Home screen and items in the Quick Settings panel. They cannot edit the Home screen, open the applications drawer, or access any device settings besides those in the Quick Settings panel or on the Home screen. They also cannot install or uninstall applications or update the operating system.

To enable kiosk mode:

1. On the Home screen, long-press on an empty part of the screen and select **Home settings** from the menu.
2. Enable the **Lock user interface** toggle switch.
3. If you have not yet created a PIN code for unlocking the UI, define one. If you have a PIN code already, you can change it if you want to.

To disable kiosk mode:

1. On the Home screen, long-press on an empty part of the screen and select **Home settings** from the menu.
2. Disable the **Lock user interface** toggle switch.
3. Enter the PIN code that you defined when you enabled kiosk mode.

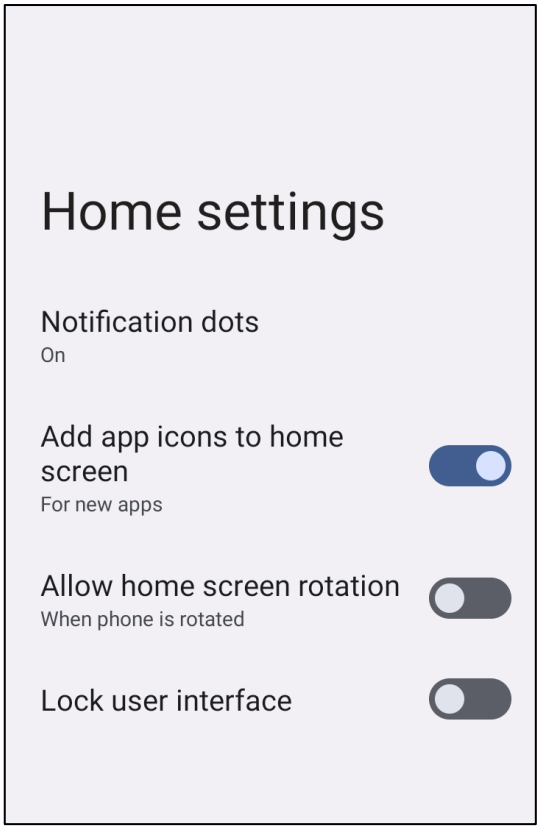

Figure 4-3. Home settings menu

Configure the Barcode Scanner

The Brady HH86 is equipped with an Opticon MDI-5300 2D imager module, which enables the device to read a wide range of 1D and 2D barcode formats.

To configure the 2D imager to read specific barcode formats, you must create and send a configuration string to the device.

You can transfer the configuration string to the Brady HH86 in multiple ways:

- Scanning a configuration barcode
- Importing a text file in the Brady RFID Demo app
- Sending a command via the NUR Accessory Extension API

The Brady RFID Demo app allows you to test your imager configuration.

Scanning Configuration Barcodes

The easiest way to configure the 2D imager is to read a barcode containing the configuration details. When the barcode is scanned, the settings are automatically saved onto the device.

To generate a configuration barcode sheet:

1. On your computer, go to the “Opticonfiguration” web tool (https://opticonfigure.opticon.com/configure).
2. Select **Code options > Readable codes**.
3. Select the desired options from the *Enable a single code only*, *Enable readable codes*, and *Disable readable codes* tabs and click **Add.**
4. In the barcode sheet **Options** dialog, make sure you are generating a 2D barcode.
5. Save or print the resulting barcode sheet.
6. Scan the barcode with the Brady HH86.

Note: Barcode configuration codes can be read only when there is no active Bluetooth connection with a host device (such as a computer).

Some example configuration barcodes are shown below.

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

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

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

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

Importing Configurations

The Brady RFID Demo app allows you to import the configuration string to the device via a text file.

To create the configuration string:

1. On your computer, go to the "Opticonfiguration" web tool (https://opticonfigure.opticon.com/configure).
2. Select **Code options > Readable codes**.
3. In the *Enable a single code only*, *Enable readable codes*, and *Disable readable codes* tabs, note the two or three-letter configuration codes beside each option that you want.
4. Insert the configuration codes into the following string format:

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

> **Example:**
>
> You want to enable the Tri-Optic and Code39 barcode formats. On the *Enable readable codes* tab, you note the following codes:
>
> - Enable Tri-Optic = **JZ**
> - Enable Code39 = **B2**
>
> The resulting configuration string is:
>
> `@MENU_OPTO@ZZ@JZ@B2@ZZ@OTPO_UNEM@`

To import the configuration string to the device:

1. Create a text file containing only the configuration string.
2. Upload the file to the Brady HH86.
3. In the Brady RFID Demo app, select **Barcode** > **Settings**.
4. Tap **Open configuration file**.
5. Browse to and select the configuration string file.

Sending Configurations Programmatically

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

```
byte [] imagerCmd (String cmd, int type);
```

Where:

- `cmd`: Configuration string
- type: Imager type (0 = Opticon MDI-5300 2D scan engine)

The return value is a byte array whose first byte indicates whether the command was successful:

- `null`: Invalid configuration string

- `ACK (0x6)`: success
- `NAK (0x15)`: fail

Example code:

```
//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!
}
```

The `imagerCmd()` method applies the configuration immediately but it is lost when the device powers off. To make the configuration persist, you must save the configuration to the non-volatile memory in the imager.

```
//SAVE CONFIGURATION TO IMAGER MEMORY

imagerCmd ("@MENU_OPTO@ZZ@Z2@ZZ@OTPO_UNEM@", 0);
```

For a practical example of how you can implement 2D imager configuration, you can study the source code for the Brady RFID Demo Android app. For more information, see page 33.

Testing Imager Configurations

After you have transferred the imager configuration to the device, you can test it in the Brady RFID Demo app. Select **Barcode** > **Settings** > **Barcode test**.

Device Configuration Backup

Configurations and settings on a Brady HH86 can be exported to a file, which can be used to restore or copy settings, such as home screen shortcuts and widgets, WLAN configuration, Brady App Center repository details, and app settings, to another Brady HH86 unit.

The backup file can be used to quickly set up multiple Brady HH86 units with the same configuration and settings.

Note: Installed application packages and files on the device are not included in the backup.

Creating Configuration Backups

To create a configuration backup:

1. In the Settings app, select **System > Backup**.
2. Select **Create backup**.

3. If it is your first time creating a backup on this device, select the folder you want the backup to be saved to.
4. Fill in the checkboxes for the app settings that you want to back up.
5. Tap **Create backup**.

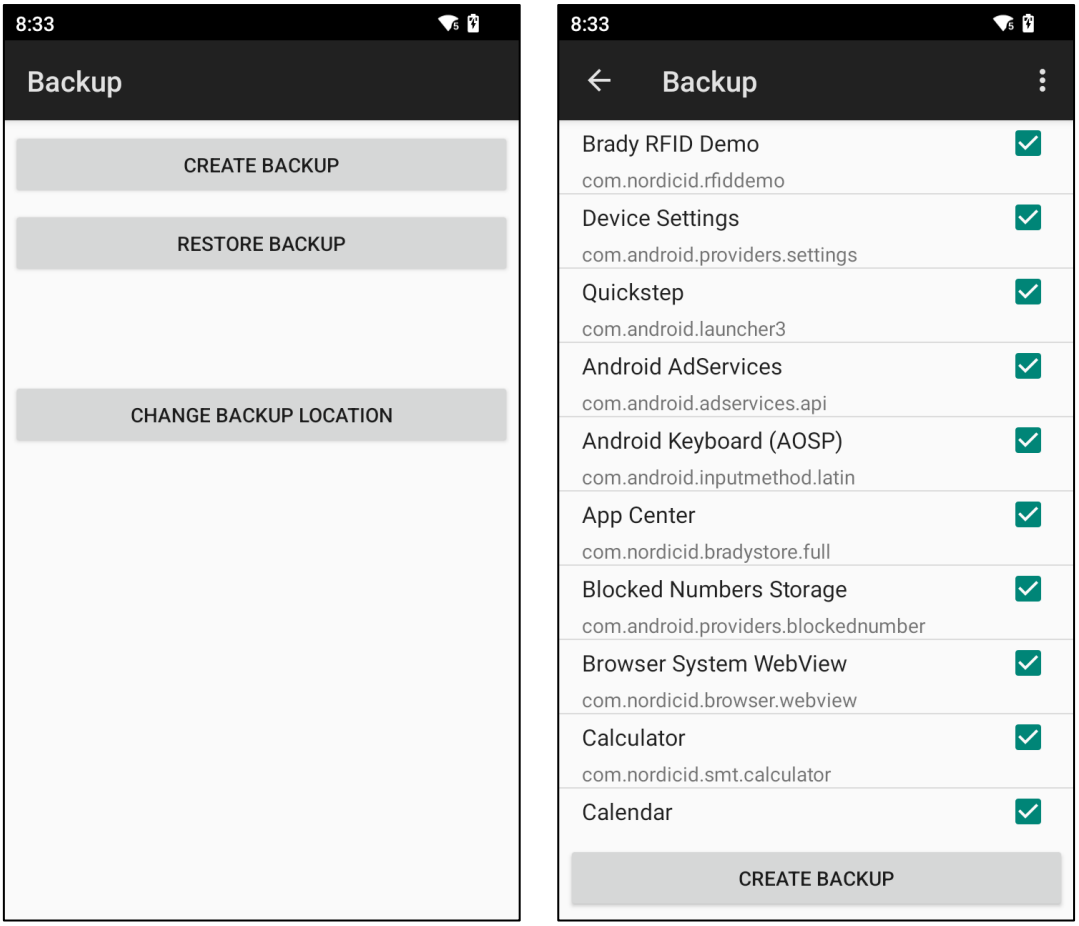

Figure 4-4. Configuration backup

Restoring Backups Manually

To restore a configuration backup manually:

1. In the Settings app, select **System > Backup**.
2. Select **Restore backup**.
3. Navigate to and open the backup file.

Restoring Backups Automatically

You can restore a configuration from a backup file without interacting with the Android user interface. To do this, connect the device to your computer, browse to the backup folder, and rename the configuration backup file to *"auto_restore_backup"*.

To restore this backup to a Brady HH86 device, copy the *"auto_restore_backup"* to the root folder of a USB flash drive and connect it to the powered-on device. The restoration process begins immediately.

If a Brady HH86 device has never created or restored a configuration backup file, you can copy the *"auto_restore_backup"* file to its "Downloads" folder. The restoration process is initiated the next time you power on the device. This procedure is useful when you need to copy the same configuration settings to multiple new devices.

Restoring Backups through Software

Software developers creating custom apps for the Brady HH86 device can initiate restoring a configuration by sending the "`ACTION_MEDIA_SCANNER_SCAN_FILE`" action to the configuration backup file. The action enables you to target a specific configuration backup file when multiple configuration backup files exist.

Factory Reset

You can reset the Brady HH86 to factory settings.

Note: The factory reset process removes all your settings, configurations, installed apps, and files from the device.

To reset the device via the touchscreen interface:

1. In the Settings app, go to System > Advanced > Reset options.
2. Select Erase all data.

If the touchscreen is not responding or the operating system is otherwise stalled, you can also initiate a factory reset with the physical buttons on the device:

1. While pressing and holding the right-hand side Scan key, press and hold the Power key until the device reboots into "fastboot" mode.
2. Navigate to **Recovery mode** using the side Scan keys and select it by pressing the Power key. The device reboots and displays the message "No command".
3. Launch the Android Recovery menu by pressing and holding the Power key.
4. Navigate to **Wipe data/factory reset** using the side Scan keys and select it by pressing the Power key.

Enterprise Mobility Management (EMM)

In a company-owned deployment scenario, the enterprise owns and fully controls the devices its employees or customers use. The Brady HH86 supports the Android Enterprise Management framework, which enables enrolling the device in Enterprise Mobility Management (EMM) or Mobile Device Management (MDM) solutions.

EMM and MDM solutions equip an administrator (a person or company) with remote management tools. The tools allow them to, for example, monitor and report on device usage, wipe data remotely, manage the installed applications, and manage who has access to the devices.

To enroll a Brady HH86 device on an EMM platform, you must provision the device in the same way as any other Android device. The provisioning process binds a device to an enterprise and sets up the device for remote management.

IMPORTANT! The device owner operation mode must be provisioned during initial device setup or immediately after a factory reset. **You cannot provision the device owner mode at any other time.**

1. The administrator creates an enrollment QR code with a management console or similar application in the EMM platform, using the “Work Managed Device” or “Device Owner” management mode. The QR code contains an enrollment token and the information needed for Android Device Policy to provision a device.
2. On a new or factory-reset Brady HH86, the user (typically an IT admin) powers on the device and taps the welcome screen six times in the same spot. The device prompts the user to scan a QR code.

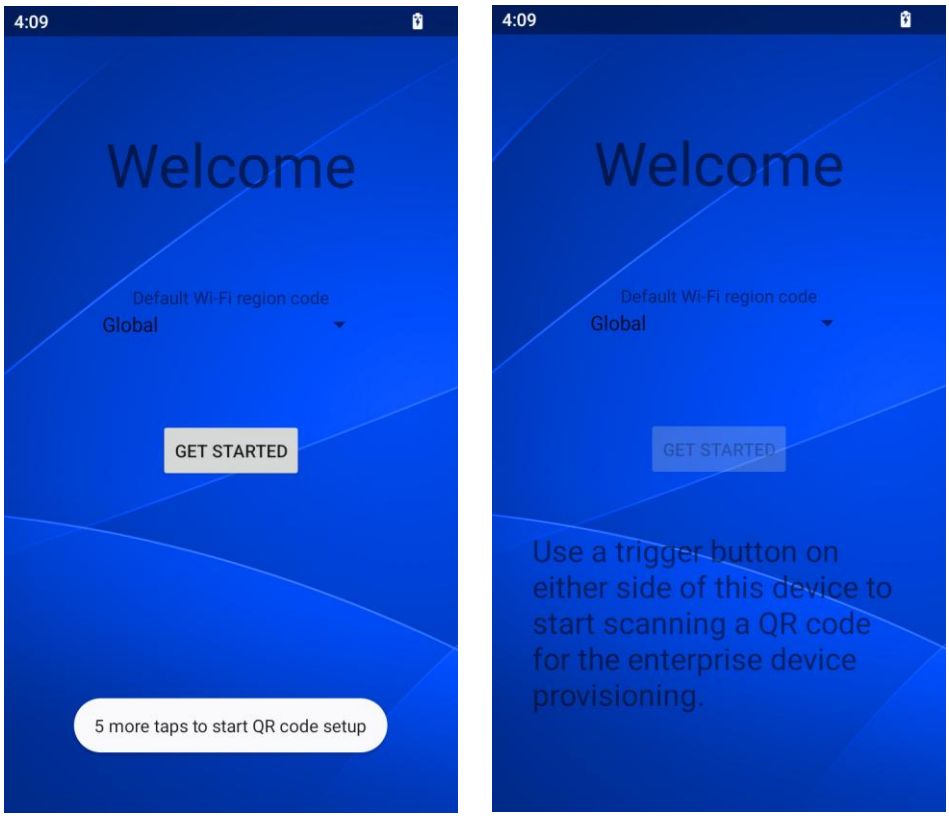

Figure 4-5. Device enrollment QR code prompt

3. The user scans the enrollment QR code using the barcode scanner. The EMM app is loaded into the managed profile on the device.
4. The user enrolls the device using the EMM app.

5 Application Development

Nordic ID by Brady has developed the NUR API (Nordic ID Universal RFID Application Programming Interface) to facilitate communication between RFID readers and software applications that manage data collected from RFID tags. The API is designed to be flexible and easy to integrate.

Developers can make use of the NUR API Software Development Kit (SDK) and sample code on GitHub to develop their own applications that implement features supported by the Brady HH86.

NUR API Architecture

The NUR API architecture consists of the following layers: application, NUR API, transport, and hardware.

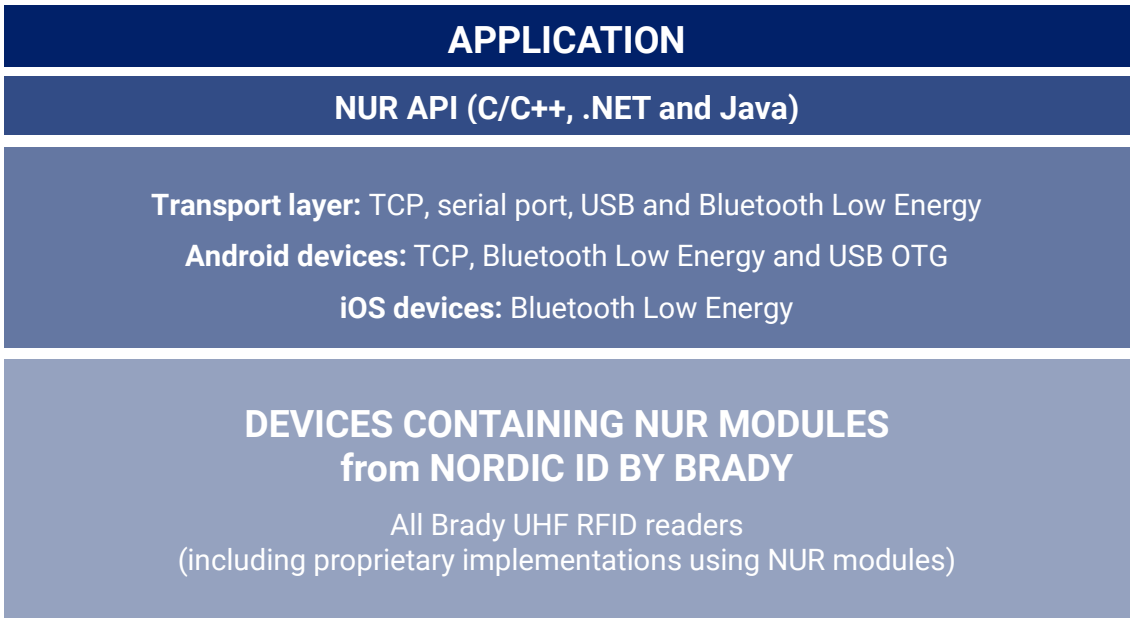

Figure 5-1. NUR API architecture layers

Developer Resources

Source code and sample projects related to the NUR API can be found in the following GitHub repositories:

Android

https://github.com/NordicID/nur_nurapi_android

https://github.com/NordicID/nur_sample_android

https://github.com/NordicID/nur_tools_rfiddemo_android

A Regulatory Compliance

Regional Settings

Regional regulatory agencies such as ETSI and FCC have defined rules and requirements for UHF RFID readers, which specify the operating frequencies, output power, and other RF parameters that are permitted.

Brady UHF RFID readers support the operating frequency range 860 – 960 MHz. Some readers cover the full operating frequency band, while others support two sub bands: 868 ETSI band (865.6 - 867.6 MHz) and 915 FCC band (902 – 928 MHz).

To ensure that Brady products comply with local regulations throughout their lifespan, devices with UHF RFID functionality are locked to predefined regional settings based on the region to which it is sold. For example, if a device is sold to a customer in Europe, its settings are configured and locked to the ETSI requirements. Similarly, if the device is sold to a customer in Australia, it is locked to the settings required in Australia.

CE

Hereby, Nordic ID, a Brady Company, 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

FCC/IC

The Brady HH86 RFID ACD device complies with Part 15 of the FCC Rules. Operation is subject to the following 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 expressly approved by the party responsible for compliance can void the user's authority to operate the equipment.

The Brady HH86 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.

RF Exposure

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

The Brady HH86 RFID reader must be operated only by holding it by the pistol grip and must be pointed away from the user and nearby persons during RFID operation.

Cet équipement est conforme aux limites d'exposition aux rayonnements RF de l'UE, de la FCC et de l'IC établies pour un environnement non contrôlé dans les conditions suivantes:

Le lecteur RFID Brady HH86 ne doit être utilisé qu'en le tenant par la poignée pistolet et doit être dirigé à l'écart de l'utilisateur et des personnes à proximité pendant l'opération RFID.

B Related Documents and Content

- Brady HH86 datasheet
- Brady HH86 Quick Guide
- Safety and Regulations Guide
- GitHub organization for developers (https://github.com/NordicID)