BRADY EXA81

USER GUIDE

TABLE OF CONTENTS

BRADY Worldwide, Inc. | ©2024 All rights reserved.
www.bradyeurope.com

BRADY Worldwide, Inc. | ©2024 All rights reserved.
www.bradyeurope.com

1. GETTING STARTED

1.1. GENERAL

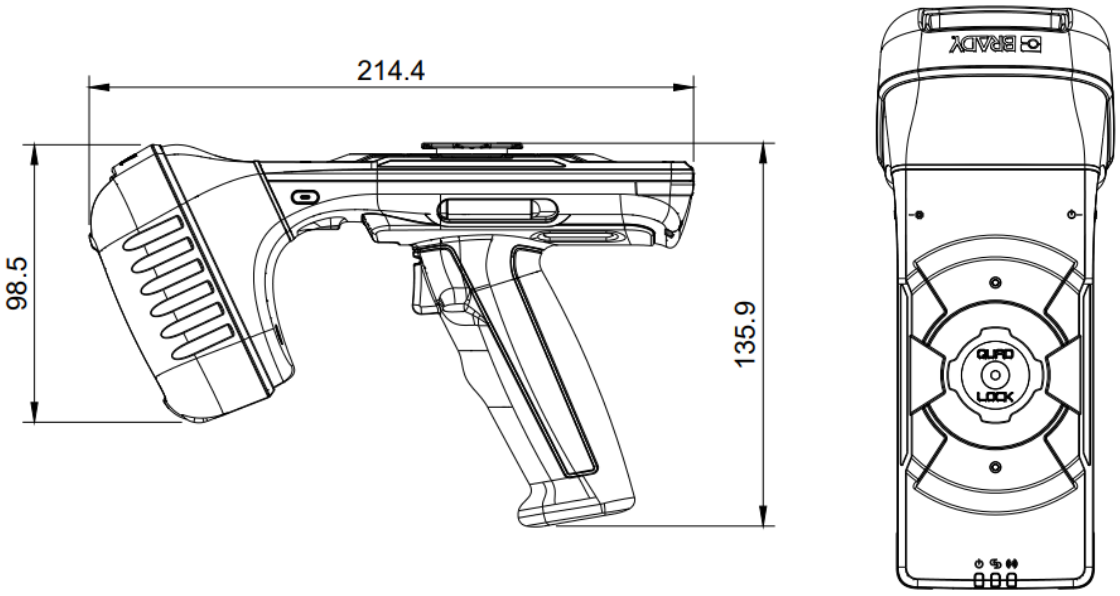
The Brady EXA81 sled reader provides UHF RFID reader capabilities and 1D/2D barcode scanning functionalities for host devices, such as smartphones, tablets, or computers. The EXA81 is used with host devices via Bluetooth® Low Energy wireless technology or USB connectivity. The reader supports Bluetooth Low Energy Class 2 connection for host devices. The supported Bluetooth Low Energy version is 5.3 and supported profiles are GATT, generic data transfer and HID, keyboard emulation.

1.2. TECHNICAL DETAILS

Supported standard	ISO 18000-63 (EPC Class 1 Gen2v2) AES authentication in accordance with ISO/IEC 29167-10 supported
Frequency	ETSI 865.6–867.6 MHz or FCC/IC 902–928 MHz
RF radiated power	ERP 2W/EIRP 3.3W
Max receiver sensitivity	-85 dBm
Reading speed	Up to 1000 tags/s
RFID	Nordic ID NUR3-1W reader module
Supported OS	Android (BLE and USB), Windows (BLE and USB), iOS (BLE)

Table 1. Technical details

1.3. MECHANICAL DIMENSIONS



BRADY Worldwide, Inc. | ©2024 All rights reserved.
www.bradyeurope.com

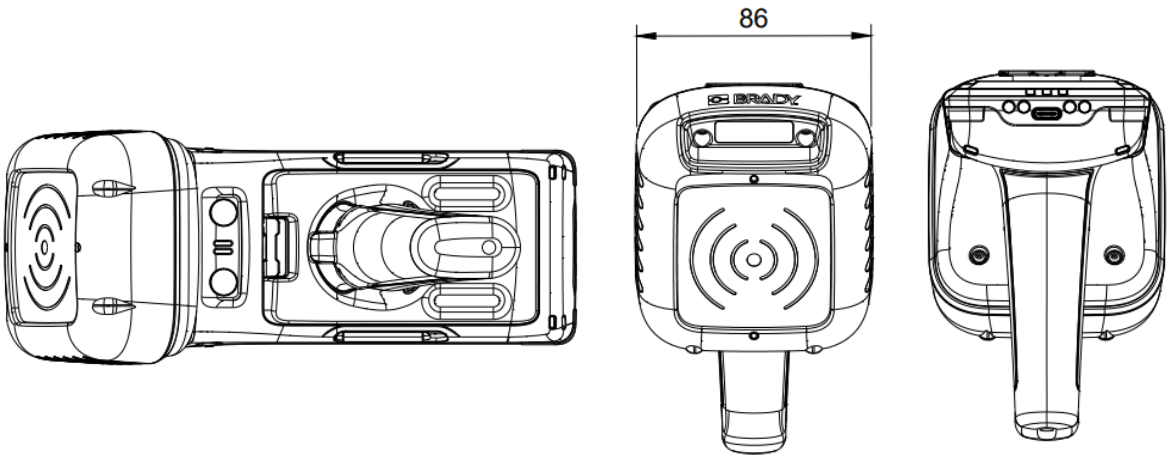


Figure 1. Dimension drawings of the EXA81

1.4. INBOX CONTENT

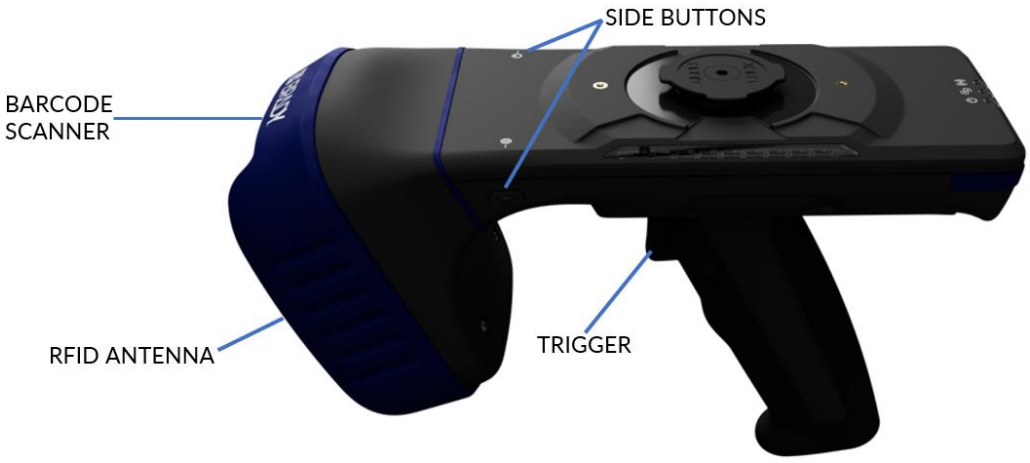
Brady EXA81 inbox contains the following items:

- Brady EXA81 sled reader
- Changeable battery pre-installed inside the pistol grip
- Wrist strap
- Safety and regulations card

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

1.5. FEATURES OVERVIEW

Picture 1. Key features of the BRADY EXA81



Picture 2. Key features of the BRADY EXA81

BRADY Worldwide, Inc. | ©2024 All rights reserved.
www.bradyeurope.com

2. CHARGING

2.1. CHARGING THE BRADY EXA81

The Brady EXA81 can be charged via desktop or a USB-C charger. The USB charger needs to have a USB-C connector.

Charging over cradle (0 to 100 %) 4 h.
Charging over type-C USB connector (0 to 100 %) 4–10 h.

Picture 3. Charging of the Brady EXA81 via USB

Picture 4. Charging the Brady EXA81 via single Desktop Charger.

The Desktop Charger has a USB-C Port on the back side which can be used for charging the host device or another EXA81.

NOTE! The USB-C and desktop chargers are sold separately.

2.2. REMOVING BATTERY

BRADY Worldwide, Inc. | ©2024 All rights reserved.
www.bradyeurope.com

Picture 5. Removing battery.

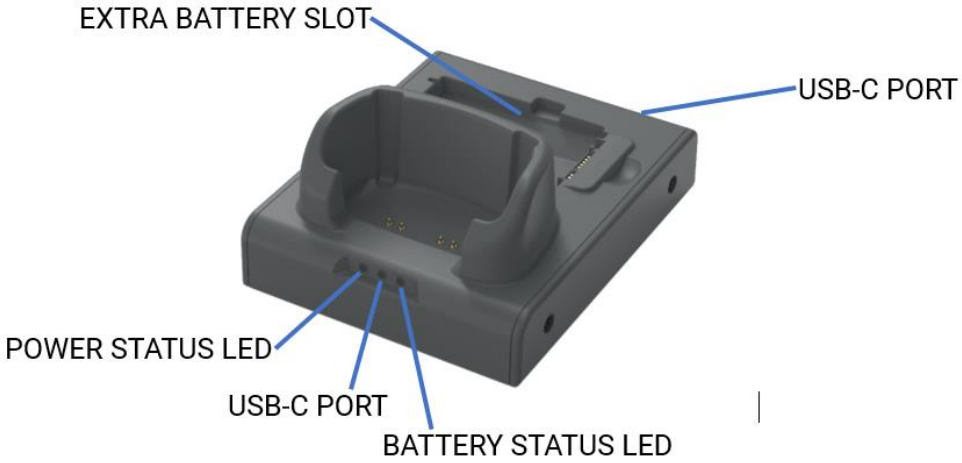
2.3. BATTERY CHARGING USING DESKTOP CHARGER

BRADY Worldwide, Inc. | ©2024 All rights reserved.
www.bradyeurope.com

The battery in the Brady EXA81 and a spare battery can be charged in the desktop charger. When using the 4-Bay Desktop Charger, four devices or batteries or a mix of both can be charged simultaneously.

Note that the Brady EXA81 and a spare battery cannot be charged in the same bay of a desktop charger because of the pistol grip.

Picture 6. Nordic ID HH83 single Desktop Charger and 4-Bay Desktop Charger



Picture 7. Features of Nordic ID HH83 Desktop Charger

The behaviour (colour) of the LEDs depends on how the main Brady EXA81 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 the USB-C port.
- Green when the EXA81 unit is in client mode, e.g., connected to a computer via USB.
- Blue when the desktop cradle detects a USB peripheral device. Note that the EXA81 does not have USB host functionality.

Extra battery status LED

- Red when a battery is being charged.
- Green when a battery is fully charged.

BRADY Worldwide, Inc. | ©2024 All rights reserved.
www.bradyeurope.com

3. FASTENING

There are two ways to attach the host device to the EXA81: Quad Lock and screw fastening.

3.1. QUAD LOCK FASTENING

Quad Lock system provides strong and secure fastening and is suitable for various host devices. Visit Quad Lock web page for more information about different adapters.

Fastening with Quad Lock is quick and easy. First, the Quad Lock adapter is attached to the host device, then the host device can be attached to the Brady EXA81 by turning and locking the Quad Lock fastening system.

NOTE! Quad Lock® universal adaptor is sold separately

Picture 8. Brady ID EXA81 fastening with Quad Lock.

3.2. SCREW FASTENING

BRADY Worldwide, Inc. | ©2024 All rights reserved.
www.bradyeurope.com

This option requires a custom case or cover for the host device. The case or cover is screwed on to the Brady EXA81. The distance between the screw holes is 68mm and the screw thread size is M3.

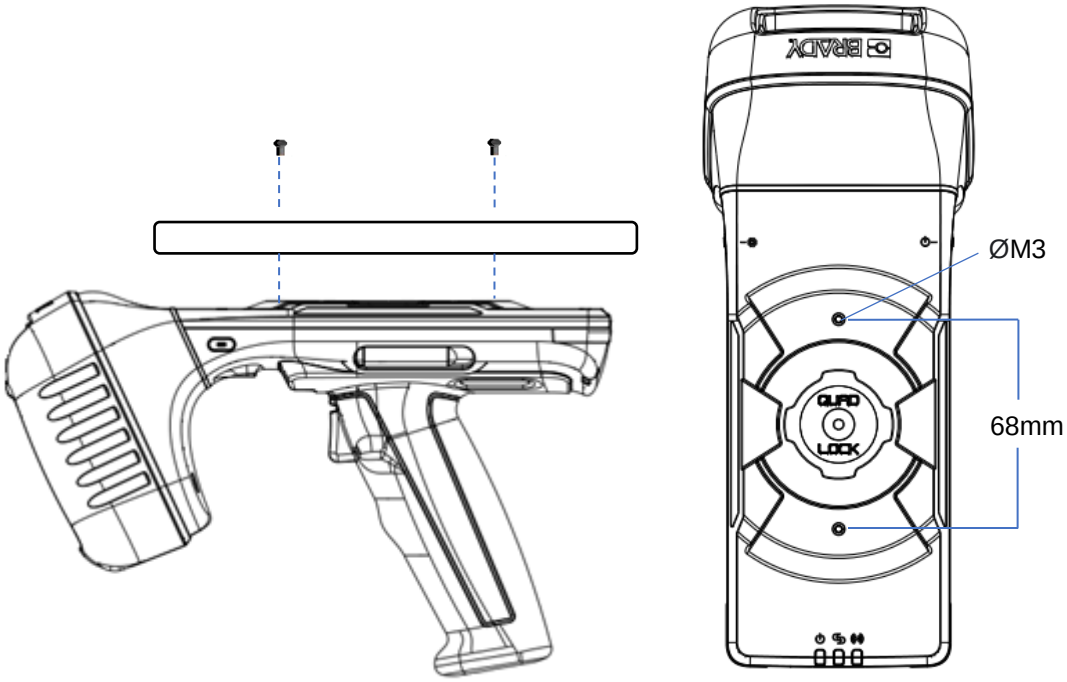


Figure 2. Fastening with screws

4. TRIGGER AND BUTTONS

The Brady EXA81 includes two physical buttons and the trigger for user interactions.

Picture 9. Location of buttons.

NOTE! Button usage depends also on the application in use.

4.1. BUTTON FUNCTIONALITIES

Functionality	Device state	Power button press	Function button press	Trigger press
Power on	Powered off			
Toggle between HID and normal mode	Powered off	N/A	>3 sec	N/A
Factory reset***	Powered off	>10 sec	N/A	N/A
Hard reset	All states	>5 sec		
Indication event	Normal and HID mode, Connected*	N/A	N/A	
Toggle between HID RFID and HID Barcode	HID mode	N/A		N/A
Power off	Not connected*		N/A	N/A
Toggle between LED bar modes	Normal mode	N/A		N/A
Unpairing	Paired, Reader on	Both buttons simultaneously, >3 sec		N/A

Table 2. Button functionalities

**A Bluetooth or USB connection between sled and host device*
**No Bluetooth or USB connection between sled and host device*
**** Factory defaults: HID RFID off, HID Barcode off, Pairing off, Side bar indication to Mode 1*

5. BUZZER

The Brady EXA81 includes a buzzer which can be used to give an audible indication to the user. By default, the buzzer beeps in the following situations:

Sound	Functionality
Three ascending notes	*The reader is turned On/Turns On at reboot.*
One beep	*Bluetooth is connected or disconnected.* *When no tags or barcodes are found.* *During HID operations.*
Three beeps in single tone	*The reader has unpaired.* *HID mode turned on.* *Factory reset.*
Three note trill	*Function code read.*
Three descending notes	*The reader is turned Off.*

Table 3. Buzzer functionalities

BRADY Worldwide, Inc. | ©2024 All rights reserved.
www.bradyeurope.com

6. LED INDICATORS

For user indications, the Brady EXA81 includes three LEDs at the bottom of the device and two LED sidebars.

Picture 10. Location of LEDs

6.1. POWER LED

Stable Power LED indicates that the device is powered ON or OFF and if the battery charge is critically low.

- Power On, Battery level ≥10%
- Power On, Battery level <10%
- Power Off

Blinking of the Power LED indicates that the sled is charging. If the charge is completed and without an active connection, the device automatically shuts down.

- Charging, Battery level ≥10%
- Charging, Battery level <10%

BRADY Worldwide, Inc. | ©2024 All rights reserved.

6.2. CONNECTION LED

Connection LED indicates the state of the USB and Bluetooth connections or if the firmware update is taking place.

Blue, blinking slowly	*Device advertising for a Bluetooth connection, not connected/not paired*
Blue, stable	*Connected via Bluetooth*
Blue, blinking fast	*Paired, no Bluetooth connection*
Green, stable	*In use by an application via USB*
Yellow, stable	*In DFU (firmware update) mode*
Purple, stable	*Updating firmware*

6.3. SCAN LED

SCAN LED indicates whether RFID or barcode reading is active or if there is a hardware failure.

Stable green	*RFID reading is ON*
Yellow	*Barcode reading is ON*
Blinking red	*Hardware failure*

6.4. LED BARS

LED bars have multiple indication modes depending on the device's configurations.

Sequential blue followed by green or red	*Power On followed by battery level indication*
Bars briefly green	*HID RFID reading enabled*
Bars briefly blue	*HID Barcode reading enabled*
Bars briefly blue	*HID mode disabled*
Four white sequential flashes	*Factory reset*
Purple sequential flashes	*Firmware update ongoing*

LED bar modes.

	Sequential green	*Mode 1, RFID reading is ON (Default)*
or	Solid Green or solid Red or sequential green	*Mode 2, Battery charge level or RFID reading is ON*
	Off	*Mode 3, LED bars off*

BRADY Worldwide, Inc. | ©2024 All rights reserved.
www.bradyeurope.com

7. OPERATING THE EXA81

The Brady EXA81 can be used in two modes: normal mode and HID mode. In normal mode the reader is controlled by the application running on the host device that can be a PC, a tablet, or a smartphone. In HID mode the reader acts like a HID - human interface device - and sends tag's EPC or barcode data content as a key press.

Both modes can be used either over a USB connection or over a BLE connection.

NOTE! Some versions of the Windows operating systems may require changing the Bluetooth device discovery mode into advanced, to show the EXA81 device.

7.1. PAIRING WITH THE HOST DEVICE

When the host device and the EXA81 are paired, they will communicate with each other whenever they are in range and Bluetooth is turned on.
In the Brady EXA81, pairing can be enabled in two different ways:

1. With the RFID Demo app for Android. Connect the Brady EXA81 to a host device and go to: Settings -> Reader -> Host device connection -> check Enable pairing (device rebooting)

2. Or reading this configuration barcode to enable pairing:

#FN#ALLOWPAIRON#

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

Once pairing has been enabled, the Brady EXA81 can be paired with a host device:

1. If the EXA81 is off, power it on by pressing the power button.
2. Open Bluetooth connection settings from the host device. Check that Bluetooth and location are enabled. NOTE: Location needs to be enabled in Android 6.0 or newer.
3. Select "EXA81 Kxxxxxxxxx" from the list.

NOTE! K123456789 is the serial number of the Brady EXA81

iOS devices may prompt a pairing request message when Brady EXA81 supports pairing. In case pairing is not needed, tap the "cancel" button and the device connects without pairing. If the iOS device is going to be used without pairing, disable pairing support and then the pairing request prompt will not appear anymore.

7.2. UNPAIRING

BRADY Worldwide, Inc. | ©2024 All rights reserved.

Note that the pairing information must be cleared from both, the host device, and the Brady EXA81.

There are three different ways to unpair the EXA81:

1. With the RFID Demo app for Android. Connect the Brady EXA81 to a host device and go to: Settings -> Reader -> Host device connection -> tap the UNPAIR button.

2. Or by reading the configuration barcode below to clear Bluetooth pairing from the Brady EXA81.

#FN#CLEARPAIRING#

NOTE! Barcode configuration codes can only be read when there is no active Bluetooth connection with the host device. Turn the host device off first to configure the EXA81.

3. Or with the physical buttons on the EXA81: while the EXA81 is on, press both the Function button and the Power button down until you hear three beeps.

7.3. IN NORMAL MODE

Software running in the host device controls the EXA81's functions. In normal mode, button presses send notification events over the API to the host device, the application then reacts accordingly.

For example, in the RFID Demo application (See 10.1) the RF scanning is started from the press of the trigger. A beep is heard when a new tag is found. A second press stops the scan. Barcodes are read one by one, per press of the trigger.

7.3.1. OVER BLE CONNECTION WITHOUT PAIRING

Once powered on, the Brady EXA81 will advertise itself via Bluetooth until a host device connects to it. Bluetooth connection remains active until the host device closes the connection. Once the connection is closed, the EXA81 will start advertising itself again and any host device can connect to it.

7.3.2. OVER BLE CONNECTION PAIRED

When pairing is enabled and established with the host device, the Brady EXA81 will not accept connection requests from other devices over Bluetooth. See section 7.2 for unpairing.

7.3.3. OVER USB CONNECTION

The Brady EXA81 can also be used over a USB connection. Note that the EXA81 reader exposes the composite USB with two profiles: the CDC and HID. Normal mode utilizes the CDC profile. If the EXA81 reader has an active USB connection, it will not advertise over BLE.

7.4. IN HID MODE

BRADY Worldwide, Inc. | ©2024 All rights reserved.

In HID mode, the Brady EXA81 functions and communicates in a similar manner as a keyboard. The reader will work with any application that supports active cursor on input fields, for example web browser applications and spreadsheets. To operate in HID mode, the Brady EXA81 needs to be configured to HID mode and paired with the host device.

When HID mode is enabled, pairing is automatically enabled as well.

HID mode can be enabled in three different ways:

1. With the RFID Demo app for Android. Connect the Brady EXA81 to a host device and go to: Settings -> Reader -> Host device connection -> check HID RFID and/or Barcode.

2. Or reading one of the configuration barcodes below to enable HID.

   - HIDMODE1 = HID barcode enabled
   - HIDMODE2 = HID RFID enabled
   - HIDMODE3 = HID barcode and HID RFID simultaneously enabled

NOTE! Barcode configuration codes can only be read when there is no active Bluetooth connection with the host device. Turn the host device off first to configure the EXA81.

3. Or with the physical buttons of the EXA81:
When the device is off, press the function button down until the led bars turn green – HID mode and pairing are now enabled.

7.4.1. OVER BLE CONNECTION

Once pairing and HID have been enabled, the Brady EXA81 can be paired with a host device which turns the EXA81 into a HID device. Pairing can be enabled from the host devices Bluetooth settings as advised in section 7.1.

NOTE! When Brady EXA81 is configured to HID mode, if non-HID applications are used (such as RFID Demo for Android) Brady EXA81 needs to be reconnected. This will enable HID mode again. The easiest way to do this is turn off/on Bluetooth of host device.

7.4.2. OVER USB CONNECTION

When HID mode is enabled and a USB connection to host device established, the Brady EXA81 will engage the USB HID profile and start sending tag or barcode read data as key presses.

BRADY Worldwide, Inc. | ©2024 All rights reserved.
www.bradyeurope.com

8. RFID CONFIGURATION

Using a proper set of RF and inventory settings is mandatory for reaching the optimal reading performance. RF settings are the main settings that influence how the RF transmitter operates within Brady EXA81. For example, settings like TX output power level and RF link profile are adjustable. Applications like the RFID Demo can be used for changing the settings. Settings are also exposed by the software API of the device.

8.1. TX POWER LEVEL

The maximum TX output power of the Brady EXA81 is 30dBm (1000mW). The power can be adjusted by 1dB steps via Nur API. In total, there are 30 steps yielding the minimum output power value of 1dBm (1mW). If you have configured more than one antenna to be used, you can set and store individual output power level for each of the antennas in question. This per antenna output power setting is also available via API. Note that if per antenna power level is set this overrides the general TX power level setting.

NOTE! Device has integrated RFID antenna which has a gain of 5dBi. This combined to conducted maximum TX output power of 30dBm will yeald to 33dBm ERP (2W ERP).

8.2. RF PROFILES

The Brady EXA81 supports three different kinds of RF profiles. The profiles are Robust, Nominal and High speed. It's 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

- Robust RF-profile as a name is misleading and is only used for backwards compatibility reasons. In the new NUR3-1W module-based devices like EXA81, the profile is for obtaining maximum reader sensitivity. This profile uses link frequency of 160 kHz and Miller 8 coding scheme providing read rates up to 80 tags/s. Due to the best sensitivity, this profile can be used when maximum read range is needed.

Nominal

- Nominal RF-profile is the default setting in readers containing the Nordic ID NUR3-1W UHF RFID module. It uses link frequency of 320 kHz and Miller 4 in ETSI lower band regions and link frequency of 250 kHz with Miller 4 coding in FCC regions and sub-sets of that. This profile uses tight DRM filters and is suitable for environments having a lot of interferences. Nominal profile provides read rates up to 250 tags/s.

High speed

- High speed RF-profile is intended to be used in use cases where the highest read rates are required. It uses link frequency of 640 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. Also, maximum sensitivity is decreased compared to robust and nominal profiles.

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

8.3. REGION

BRADY Worldwide, Inc. | ©2024 All rights reserved.

The reader has pre-defined region settings defining frequency and channel sets for operating under different radio regulations. Globally the regulations vary depending on the country. Refer to Nur API documentation for list of pre-defined countries. When module ships from the production it is locked to pre-selected (based in the SKU) region setting and cannot be changed by the user.

8.4. RSSI FILTERS

The EXA81 has internal RSSI filters which can be used to limit the read range. By applying the filters, you can set the limits which tag replay must be met to be registered. MIN RSSI –value means that tag replay signal needs to be equal or stronger than the defined value. Otherwise, a tag is not read. MAX RSSI value in other hand means that signal strength must be lower than the filter value. There are separate RSSI filter values for inventory, read and write operations. These can be set individually.

8.5. INVENTORY SETTINGS

By selecting the proper RFID inventory parameters, you can optimize the modules reading performance for different tag populations and use cases.

8.5.1. Q-VALUE

The Q-value defines the amount of open response slots that tags can use per one inventory round. Number of slots can be calculated by formula 2Q. It is advised to use twice as many slots compared to the number of tags that you have in your readers reading field simultaneously. Selectable values are 0 – 15 where 0 means automatic Q-value adjustment. In this automatic mode the reader will adjust Q-value between sequential rounds based on the number of found tags and collisions. By default, the Q-value is set to 0.

Q-value	Response slots	Q-value	Response slots
0	Automatic	8	256
1	2	9	512
2	4	10	1024
3	8	11	2048
4	16	12	4096
5	32	13	8192
6	64	14	16384
7	128	14	32768

Table 4. Relation between the Q-value and the number of response slots for a round.

8.5.2. ROUNDS

While a fixed Q-value (non-zero) is used, the Rounds value defines the number of query rounds done inside one full inventory round. After every full inventory round the sled will send the read results to the host. When automatic Q-adjustment is used, the Rounds value adjusts the threshold for exiting the inventory loop. By default, rounds setting is set to 0. This setting can help the reader to find all the tags that are in the reading field when using session 0. Because tags that are found in query round 1 don't replay in the following query rounds. When using session 1/2/3 this does not make any significant difference because tags that are read are quiet anyway.

Inventory round		
Query round 1	Query round 2	Query round n

Table 5. Relation between inventory round and query round (Round setting).

8.5.3. SESSION

There are 4 session options which you can use when initializing an inventory round. Every session has two target states; A and B. By default, Gen2 tags are at state A if the tag has not been recently read. When tag is read it flips to state B and doesn't reply to the readers query made using target A. The table below describes the persistence of tag's state machine when using different session values. For example, when using session 0 the tag will come back to state A immediately when tag power is lost. Usually, tag loses the power when the reader stops the inventory round or changes the channel.
Persistence when tag power is ON is not defined by the ISO18000-63 when using session settings S0, S2 and S3. With session 1 the tag will keep its state over 500ms but less than 5s. With session values 2 and 3 tags will keep its states over 2s when tag power is lost. Time can vary depending on what tag IC is used.

Session flag	**Persistence: Tag powered**	**Persistence:**
S0	Indefinite	None
S1	500ms<t<5s	500ms<t<5s
S2	Indefinite	t>2s
S3	Indefinite	t>2s

Table 6. Persistence characteristics of ISO18000-63 tags.

8.5.4. DEFAULT RF SETTINGS

A new device has the following RF settings:

TX Level	1000mW
RF Profile	Nominal
Q	0
Rounds	0
Session	0
Target	A
Enabled antennas	CrossDipole.Y, CrossDipole.X
Region	Your region setting
Inventory filter Min	Disabled
Inventory filter Max	Disabled
Write filter Min	Disabled
Write filter Max	Disabled

Table 7. Initial RF settings

8.6. ANTENNAS

BRADY Worldwide, Inc. | ©2024 All rights reserved.

The Brady EXA81 has an Adaptive Cross Dipole antenna that has a SW controllable antenna mode via the RFID Demo application and NUR API. The antenna is linear with a horizontal and/or a vertical polarization mode. The nominal reading distance is about 15m/50ft. Linear antenna modes are intended for long range reading when tag density is high, and tags are in horizontal or vertical positions. In most cases enabling both linear antenna modes provide for the best performance.

Picture 11. Tags in horizontal and vertical alignment

NOTE! The reading range depends on type of tags used and the environment.

BRADY Worldwide, Inc. | ©2024 All rights reserved.
www.bradyeurope.com

9. 2D IMAGER

This section describes methods for configuring the 2D imager of the Brady EXA81. The 2D imager module in use is the Opticon MDI-4100 2D scan engine.

Opticon provides online configuration tools: http://opticonfigure.opticon.com/

Standalone PC software: http://wiki.opticonusa.com/techsupport/en/Universal_Config_Tool_2D

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

1. Using a configuration barcode
2. Using the Nordic ID RFID Demo for Android application
3. Configuring via NUR Accessory extension API

9.1. USING CONFIGURATION BARCODES

The easiest way to configure the 2D imager is to read a configuration code with the 2D imager. Please use Opticon's configuration tools (see link above) for creating configuration barcode and print it to paper. Read the configuration code with the 2D imager of the Brady EXA81 and new settings will be set and saved automatically. **Note that barcode configuration codes can be read only when there is no active Bluetooth connection with the host device**. Example configuration barcodes below. More 2D imager configuration barcodes can be found from APPENDIX .

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@

9.2. USING THE RFID DEMO APPLICATION

BRADY Worldwide, Inc. | ©2024 All rights reserved.

RFID Demo for Android makes testing different barcode configurations easy. Configurations can be read and set from specific files. The specific file is a simple text file containing configuration command strings generated by the Opticon's configuration tool. The configuration settings of the RFID Demo for Android can be accessed via the Settings menu or the Barcode functionality.

Opticon's configuration tools provide configuration strings. The barcode type must be a 2D-Code like PDF417. The format of configuration a string is:

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

Opticon's configuration tools show a two or a 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 a configuration file to the reader, Brady RFID Demo for Android will send a "save settings" command automatically to the 2D imager. The source code of the RFID Demo for Android is public, so you can study how the 2D imager configuration using the specific files has been implemented on Android. See section 0 for more information.

BRADY Worldwide, Inc. | ©2024 All rights reserved.

9.3. CONFIGURING VIA NUR ACCESSORY EXTENSION API

NUR Accessory Extension API provides commands 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 a 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 a configuration to the 2D imager, settings are ready to be used but the next power down causes settings to be lost. It is important to save settings to the volatile memory of the imager.

//SAVE CONFIGURATION TO IMAGER MEMORY

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

BRADY Worldwide, Inc. | ©2024 All rights reserved.

10. SOFTWARE

Brady has taken an open-source SW development approach with the Brady EXA81. Nordic ID provides the SDK along with the examples through GitHub. The Brady EXA81 supports the powerful NUR API so developers can use the familiar NUR API for application development.

10.1. RFID DEMO APPLICATION

Nordic ID by Brady provides feature rich yet easy-to-use RFID demo applications for iOS and Android platforms.

10.1.1. RFID DEMO FOR ANDROID

Nordic ID RFID Demo for Android application supports Android 5.0 and newer versions. The Nordic ID RFID demo application is available from the Google Play store.

10.1.2. NORDIC ID RFID FOR IOS

Nordic ID RFID application for iOS supports iOS 9 and newer versions. The Nordic ID RFID application is available from the App store.

10.2. NORDIC ID KEYBOARD AND WEDGE SERVICE

Nordic ID Keyboard and Wedge service applications provide wedge functionality for Android devices. Android 5.0 and newer versions are supported.

Nordic ID Keyboard

Nordic ID Wedge service

10.3. NORDIC ID SMART WEAR APP

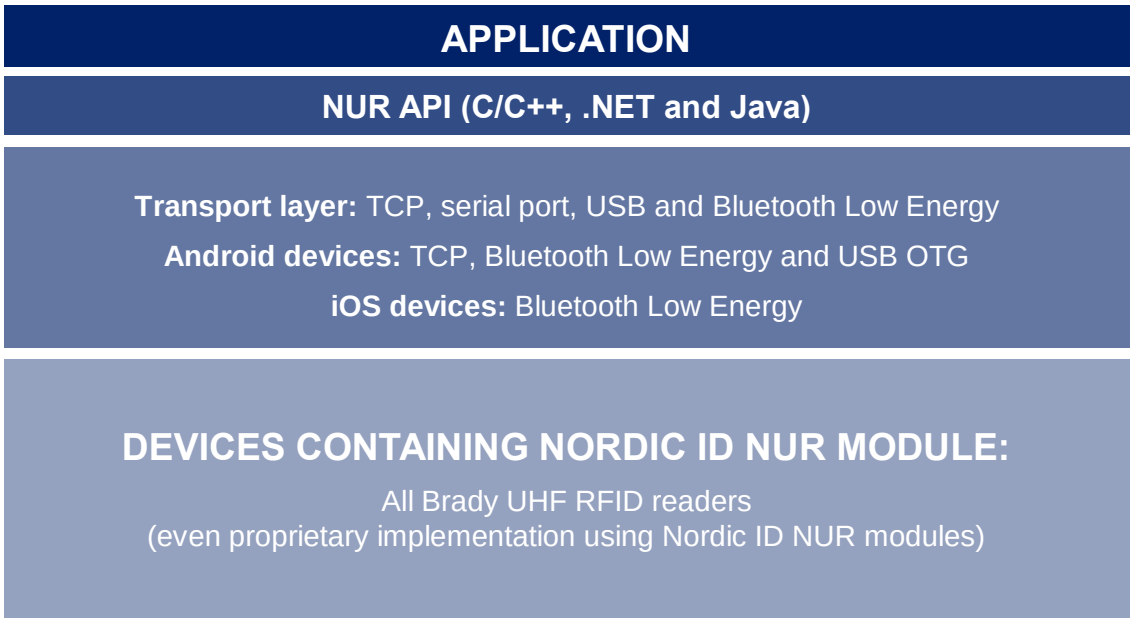
Nordic ID Smart Wear app for smartwatches supports Android Wear 2.0 or Wear OS 1.0 and newer versions. The Nordic ID RFID Smart Wear app is available from the Google Play store.

BRADY Worldwide, Inc. | ©2024 All rights reserved.
www.bradyeurope.com

11. APPLICATION DEVELOPMENT

11.1. NUR API IN GENERAL

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



Picture 12. NUR API architecture

11.2. APPLICATION DEVELOPMENT KIT

BRADY Worldwide, Inc. | ©2024 All rights reserved.
www.bradyeurope.com

Brady provides Software Development Kits (SDK) and code samples via GitHub for Android, iOS and Windows:

https://github.com/NordicID/

The Software Development Kits provide development basics for the Brady EXA81. Samples utilizing the Android, iOS and Windows specific accessory extension used with the Brady EXA81 are available from GitHub as well (includes e.g., barcode and RFID HID). Samples utilizing NUR API in general are available for Android, iOS and Windows (includes RFID generic operations such as write, locate etc.).

More information including source code and samples can be found from GitHub:

Android

https://github.com/NordicID/nur_nurapi_android

https://github.com/NordicID/nur_sample_android

https://github.com/NordicID/nur_tools_rfiddemo_android

iOS

https://github.com/NordicID/nur_sample_ios

https://github.com/NordicID/nur_sample_windows/tree/master/Win10_UWPSample

https://github.com/NordicID/nur_sample_windows

BRADY Worldwide, Inc. | ©2024 All rights reserved.

https://github.com/NordicID/rfiddemo_xamarin

BRADY Worldwide, Inc. | ©2024 All rights reserved.

12. FIRMWARE UPDATE

Brady will offer an updating library which can be used to update the EXA81 firmware. Firmware update can also be done using the Android Demo application.

13. REGIONAL SETTINGS

Brady UHF RFID readers support operating frequency range between 860 - 960MHz. Some of the readers 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 such 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 with local regional requirements.

Brady has created a set of regional settings in order to fulfill local regulations. Brady is required to ensure that the compliance of Brady ID products remains after production. A solution to this is that products including UHF RFID functionality will be set and locked to a region in production, based on customer order. For example, if a product is ordered to Europe, it will be locked to ETSI region and if a product is ordered to Australia, then it is locked to the Australia region. When a product is locked to an individual region, it will comply with local regulations of that region.

14. SERVICE AND SUPPORT

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

E-mail: tseurope@bradycorp.com
Telephone: +44 333 333 1111

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 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.

For any enquiries about Brady repair service please contact:

E-mail: tseurope@bradycorp.com
Telephone: +44 333 333 1111

15. 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.

BRADY Worldwide, Inc. | ©2024 All rights reserved.

16. RELATED DOCUMENTS AND CONTENT

- Brady EXA81 datasheet
- Brady Safety and Regulations Guide
- Nordic ID GitHub account for developers (https://github.com/NordicID)

17. VERSION HISTORY

Version	Date	Modifications
0.1	7.7.2023	First version
0.2	26.9.2023	Renewed layout, updated information
0.3	16.10.2023	Version for comments
0.4	17.10.2023	Layout overhaul
0.5	24.10.2023	2nd version for comments
0.6	3.11.2023	3rd version for comments
0.7	10.11.2023	Added drawings
0.8	30.11.2023	Minor fixes
1.0	1.12.2023	Final version

BRADY Worldwide, Inc. | ©2024 All rights reserved.
www.bradyeurope.com

18. APPENDICES

18.1. APPENDIX 1 CONFIGURATION BARCODES

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


#FN#HIDMODE0#


#FN#HIDMODE0#


#FN#HIDMODE0#


#FN#HIDMODE0#


#FN#HIDMODE0#


#FN#HIDMODE0#


#FN#HIDMODE0#


#FN#HIDMODE0#

BRADY Worldwide, Inc. | ©2024 All rights reserved.
www.bradyeurope.com

18.2. APPENDIX 2 SAMPLE 2D IMAGER CONFIGURATION BARCODES

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

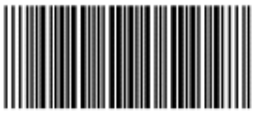
Code 39

Code 39

Code39 Italian Pharmaceutical

Code 39 Full ASCII

Tri-Optic



Codabar

Codabar

Codabar ABC

Codabar CX

Industrial 2 of 5 / Interleaved 2 of 5

Industrial 2 of 5

Interleaved 2 of 5

S-Code

BRADY Worldwide, Inc. | ©2024 All rights reserved.
www.bradyeurope.com