NORDIC ID EXA31

USER GUIDE

TABLE OF CONTENTS

1. GETTING STARTED

1.1. GENERAL

Nordic ID EXA31 provides UHF RFID reader capabilities and optional 1D/2D barcode scanning functionalities for host devices. Nordic ID EXA31 is used with the host devices via Bluetooth® Low Energy wireless technology.

1.2. AVAILABLE VARIANTS

Nordic ID EXA31 is available in 4 different variants:

CODE	FREQUENCY	2D IMAGER
IWB00001	868MHz	Yes
IWB00003	868MHz	No
IWB00004	915MHz	Yes
IWB00005	915MHz	No

1.3. AVAILABLE ACCESSORIES

CODE	DESCRIPTION
ACN00173	Nordic ID USB Charger for Nordic ID EXA31
ACP00097	Quad Lock Universal Adaptor v1. The Quad Lock Universal Adaptor with 3M™ adhesive is a super thin adaptor that is compatible with all Quad Lock™ mounts. The Quad Lock Universal Adaptor designed to be used only once, it is not re-stick-able.

1.4. PACKAGE CONTENT

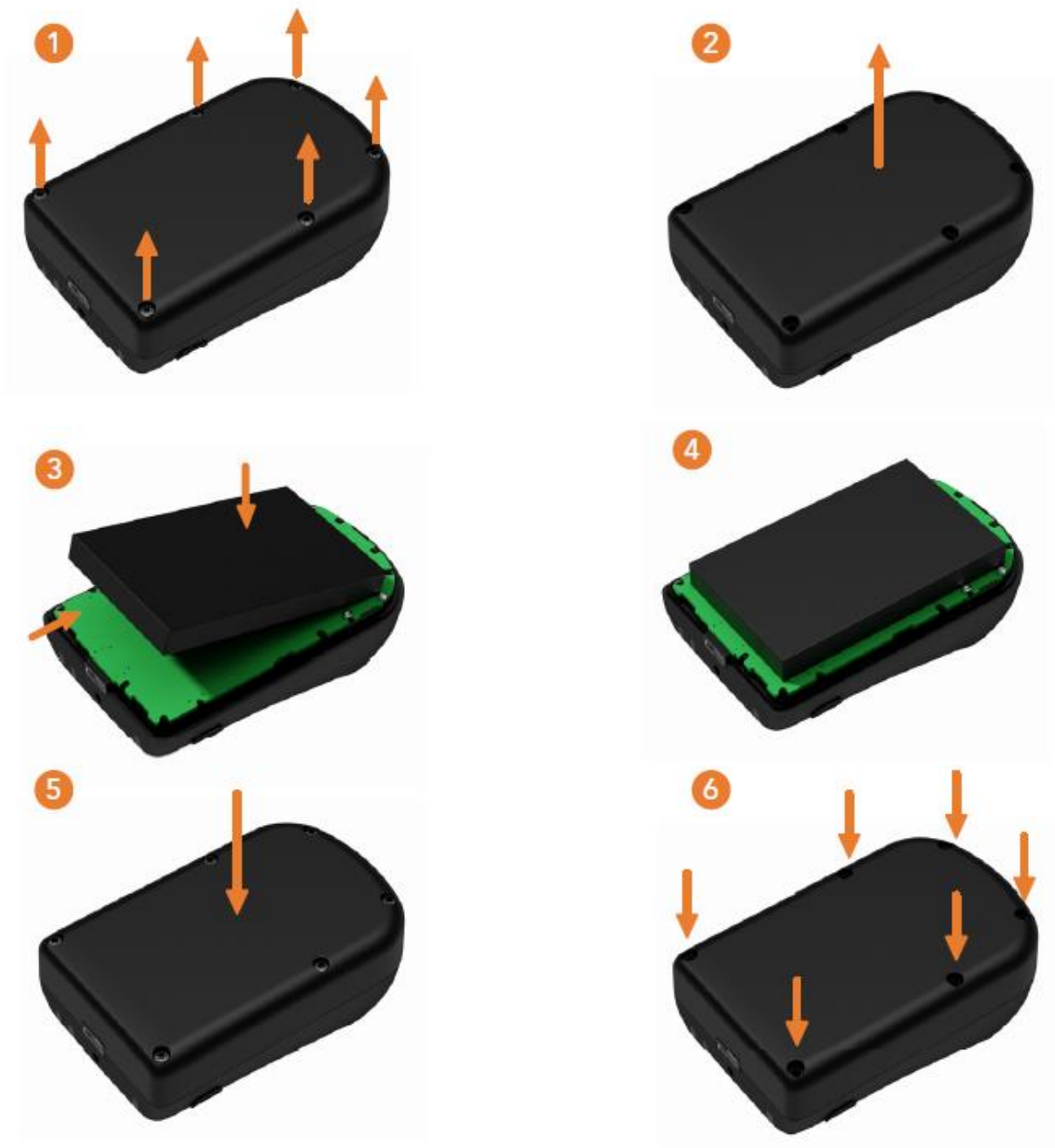Nordic ID EXA31 package contains following items

- Nordic ID EXA31

- Battery (installed)

- Safety and regulations guide

1.5. FEATURES OVERVIEW

Picture 1. Key features of Nordic ID EXA31

1.6.   INSTALLING BATTERY

Picture 2. Installing battery

1.7. CHARGING

Nordic ID EXA31 can be charged via USB charger. Maximum charging power via the cradle is 2.5W (5V @ 500mA). Charging time from 0 – 100% is about 4 hours. The USB charger needs to have a micro USB connector and the recommended charging power is at least 2.5W (5V @ 500mA).

Charging status is indicated by Power LED. Please see section 1.11.2.3 for information how the Power LED functions in different situations.

Picture 1 Charging Nordic ID EXA31 via USB charger

NOTE! The USB charger is sold separately by Nordic ID.

1.8. FASTENING

Nordic ID EXA31 can be fastened with several methods. Only Quad Lock fastening is described in the user guide.

1.8.1. QUAD LOCK® FASTENING

The Quad Lock fastening is a popular and easy-to-use fastening system. The Quad Lock fastening system provides strong and secure fastening and is suitable for different kind of host devices. Please visit Quad Lock web pages for more information about different adapters.

Fastening of Nordic ID EXA31 with the Quad Lock is easy. The first step is to attach a Quad Lock adapter on the bottom of Nordic ID EXA31. The second step is to fasten Nordic ID EXA31 with Quad Lock mount wherever needed.

NOTE! Quad Lock® universal adaptor is sold separately

1.9. CONNECTIONS

Nordic ID EXA31 supports only Bluetooth Low Energy Class 2 connection for host devices. Supported Bluetooth Low Energy versions are 4.0 – 4.2 and supported profiles are GATT and HID.

NOTE! Bluetooth Low Energy needs to be supported by host device

1.9.1. CONNECTING WITH HOST DEVICE VIA HID MODE

In this mode, Nordic ID EXA31 functions and communicates in a similar manner as a keyboard. Therefore, the device will work with any application that supports an active cursor on input fields, for example web browser applications. When operating in HID mode, Nordic ID EXA31 needs to be paired with the host device and configured for the HID mode.

> **NOTE!** When Nordic ID EXA31 is configured for HID mode, remember to reconnect Nordic ID EXA31 after using non-HID applications (such as Nordic ID RFID Demo). This will enable the HID mode again. The easiest way to do this is turn off/on Bluetooth of host device.

1.9.2. PAIRING NORDIC ID EXA31 WITH A HOST DEVICE

1. Turn Bluetooth of the host device ON. NOTE: Android 6.0 or newer needs location to be enabled also

2. Power on Nordic ID EXA31 by pressing the power button for 2...3 seconds

3. Open Bluetooth connection settings of host device and you should see "EXA31 XXXXXX" in the list

4. Select "EXA31 XXXXXX" from the list in order pair your host device with Nordic ID EXA31

> **NOTE!** XXXXX is a serial number of Nordic ID EXA31

1.9.3. CONFIGURING HID MODE WITH BARCODE

Read barcode below to configure Nordic ID EXA31 to desired HID mode. Make sure device is not connected with Bluetooth while configuring with barcodes.

- HIDMODE0 = All HID modes disabled
- HIDMODE1 = HID barcode enabled
- HIDMODE2 = HID RFID enabled

#FN#HIDMODE0#   #FN#HIDMODE1#

#FN#HIDMODE2#

1.9.4. CONFIGURING HID MODE VIA APPLICATION

1. Install Nordic ID RFID Demo application (see section 2.1)

2. Connect your device

3. Turn on HID mode, RFID and/or barcode mode in reader settings

4. Close application and make sure Bluetooth connection is closed

5. Reboot your Nordic ID EXA31 device by pressing the power button for 2...3 seconds.

1.10. OPERATING WITH HID MODE

1.10.1. HID BARCODE ENABLED

Reading Barcode:

- Pressing trigger down → barcode aimer starts →Releasing trigger →scanning start

- When tag found, result is sent to HID immediately

- Pressing trigger down during scan → scanning aborted

1.10.2. HID RFID ENABLED

Reading RFID tags:

- Pressing trigger down → RFID reading starts

- Reader read tags in memory as long trigger is kept down. Short beep when new tags found

- Releasing trigger → Reading stops and tags in memory will be transmitted to HID. Short beep when single tag sent. If no tags found, double low note beeps.

> **NOTE!** HID operation is slow and it's not very useful for cases where need to read and transfer high amount of tags (> 5)

1.10.3. BOTH: HID BARCODE & HID RFID ENABLED.

Activate Barcode reader:

- Trigger click (short press (<350ms) and released immediately) → Barcode scanning starts immediately without aiming.

- Trigger press and keeping down at least 350ms →Barcode aimer starts →Trigger released → scanning starts.

Activate RFID reader:

- Pressing trigger "double click" and keeping down → RFID reading starts. Searching tags. Beep when tags found.

- Releasing trigger → Reading stops and tags in memory will be transmitted to HID. Short beep when a single tag sent. If no tags found, double low note beeps.

- Pressing trigger during tag sending → aborted.

- Pressing trigger during barcode scanning → aborted.

Nordic ID Group | Joensuunkatu 7 | FI-24100 Salo |Finland
Office +358 2 727 7700 | Fax + 358 2 727 7720 | info@nordicid.com

9 / 16

1.11. USING THE READER

1.11.1. BUTTONS

Nordic ID EXA31 has three physical buttons for user interactions. Location of the buttons can be seen in Picture 2.

Picture 2 Location of the buttons

1.11.1.1. TRIGGER BUTTON

The trigger button is located at the top of the reader. It can be used to start/stop UHF RFID/barcode scanning and turn the reader on. When turning the reader on the trigger button needs to be pressed 0.5 seconds until blue LED starts blinking before it triggers. This ensures that accidental presses are avoided. 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! Button usage depends on the application in use.

1.11.1.2. POWER BUTTON

Power button turns reader On/Off. The power button needs to be pressed for about 2...3 seconds until red LED turns to green before it triggers, this ensures that accidental presses are avoided. The power button is disabled when Nordic ID EXA31 has an active Bluetooth connection with the host device.

NOTE! Reader can be powered down even though it has an active Bluetooth connection by pressing power button down at least 7 seconds

1.11.1.3. UNPAIR A BLUETOOTH DEVICE BUTTON

If Nordic ID EXA31 is paired to the host device, it stores information about the paired devices and tries to connect automatically when turned on. Using the "Unpair a Bluetooth device" button clears the paired device from the memory of Nordic ID EXA31.

Unpairing:

- Make sure device is disconnected.

- Press and keep "Unpair" button down at least 3 second.

- When device beeps three times, pairing is cleared. Device may reboot.

> **NOTE!** The "Unpair a Bluetooth device" button is disabled when the Nordic ID EXA31 has an active Bluetooth connection with host device

1.11.2. LED INDICATORS

Nordic ID EXA31 has three LEDs for user indications. Location of the LEDs (Read/HID/Configurable, Bluetooth and Power) can be seen in Picture 3.

Picture 3 Location of LEDs

1.11.2.1. READ/HID/CONFIGURABLE LED

By default, Read/HID/Configurable LED indicates whether RFID or barcode reading is active. The Read/HID/Configurable LED can be configured via API if needed.

- 🟢 RFID Read
- 🟠 Barcode read
- ⚪ No read

1.11.2.2. BLUETOOTH LED

Bluetooth LED indicates whether the Bluetooth connection is On/Off or in search mode.

Bluetooth LED

● BT On
━━○ Ready to connect
● BT off

1.11.2.3. POWER LED

The Power LED indicates whether the reader is On/Off and it also indicates the battery level of the reader. The colour of the Power LED indicates the battery level.

Power On
● Battery Full
\> 20 %

Power On
● Battery Low
< 10 %

Power On
● Battery Medium
10–20 %

● Power Off

Blinking of the Power LED indicates that the device is charging. The battery level during charging is indicated by the colour of the blinking Power LED.

━━○ > 90 %
━━○ 30–90 %
━━○ < 30 %

1.11.3. ANTENNAS

Nordic ID EXA31 is equipped with a circularly polarized UHF RFID antenna. Nominal read range is up to 2m / 6.6 ft.

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

2. SOFTWARE

Nordic ID has taken an open source SW development approach in use with Nordic ID EXA31. Nordic ID provides the SDK along with the examples through the GitHub. Nordic ID EXA31 supports powerful NUR API so developers can use familiar NUR API for application development.

2.1. NORDIC ID RFID DEMO APPLICATIONS

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

2.1.1. NORDIC ID RFID DEMO FOR ANDROID

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

2.1.2. NORDIC ID RFID DEMO FOR IOS

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

2.2. APPLICATION DEVELOPMENT

2.2.1. 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 in Picture 4.

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)
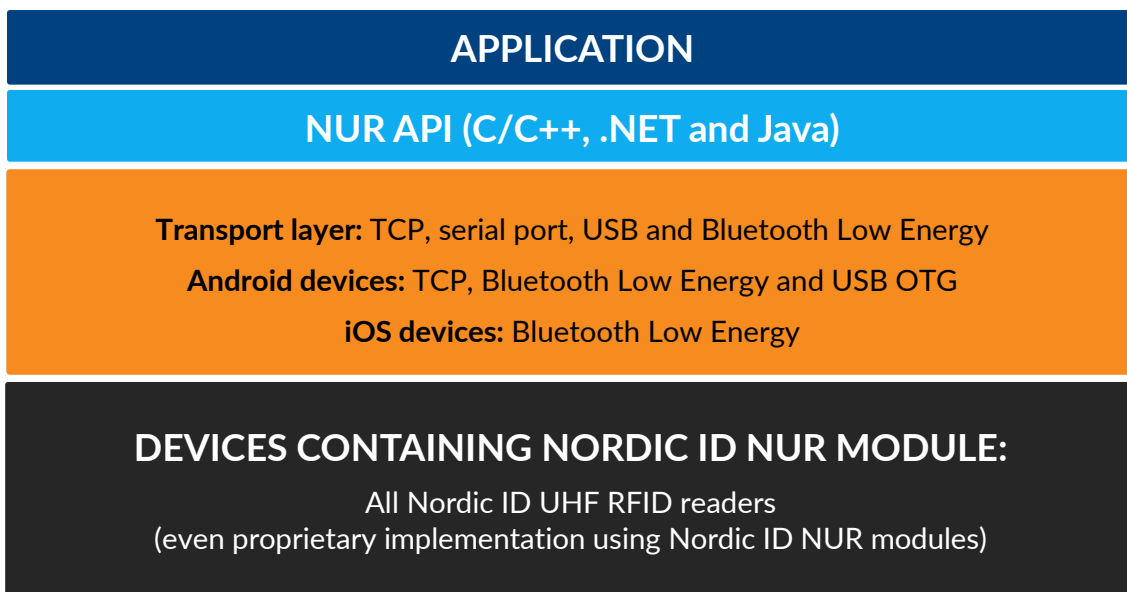
Picture 4 NUR API architecture

2.2.2. APPLICATION DEVELOPMENT

Nordic ID provides Software Development Kits (SDK) and code samples via GitHub:

https://github.com/NordicID/

The Software Development Kits provide development basics for Nordic ID EXA31. Samples utilizing the Android and iOS specific accessory extension used with Nordic ID EXA31 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 via:

Android

https://github.com/NordicID/nur_sample_android

iOS

Nordic ID Group | Joensuunkatu 7 | FI-24100 Salo |Finland
Office +358 2 727 7700 | Fax + 358 2 727 7720 | info@nordicid.com

14 / 16

https://github.com/NordicID/nur_sample_ios

2.1.   FIRMWARE UPDATE

Firmware of Nordic ID EXA31 consists of four different firmware which are:

- NUR firmware (firmware of the NUR RFID module)

- NUR bootloader (bootloader of the NUR RFID module)

- Device firmware (firmware of the reader)

- Device bootloader (bootloader of the reader)

All the firmware can be updated by using Nordic ID RFID demo applications presented in section 2.1 or implementing update functionality to 3rd party application using instructions that can be found from section 2.2.

3. 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 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

4. 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.

5. RELATED DOCUMENTS AND CONTENT

- Nordic ID EXA31 datasheet

- Nordic ID EXA31 Quick Guide

- Nordic ID Safety and Regulations Guide

- Nordic ID GitHub account for developers (https://github.com/NordicID)

6. 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.

Nordic ID Group

Salo IoT-Campus
Joensuunkatu 7
FI-24100 Salo
FINLAND

tel. +358 2 727 7700
fax +358 2 727 7720

www: www.nordicid.com
E-mail: info@nordicid.com

7. VERSION HISTORY

Version	Date	Modifications
1.0	19.8.2017	The first version