Identium CX1500N SDK

Integration Guide for Android

SDK 2.9 · package 2.9.1 · 27 October 2026

This guide explains how to integrate the Identium CX1500N UHF RFID SDK into an Android application, how to try it with the demo app, and how to verify its support for Android's 16 KB memory page size.

The SDK is delivered as a single self-contained Android library: `IdentiumCX1500N.aar`. It contains everything required — native libraries and the bundled open-source libraries are packed inside it.

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1. What is in the package

Path	Description
`IdentiumCX1500N.aar`	The SDK. This single file is all an integrator needs.
`IdentiumCX1500N-Demo_2.9.apk`	Demo application built on the SDK. Install it on the CX1500N to try every function.
`Identium-CX1500N-SDK-Integration-Guide.pdf`	This guide.
`docs/SDK-Developer-Guide.md`	Full API reference, code examples, protocol notes, RF link configuration and parameter persistence.
`check16k.py`	Checks 64-bit native libraries for Android 16 KB page-size support (section 7).
`README.md`	Package overview and quick start.

2. Android 16 KB page size — current status

Google Play requires applications targeting Android 15 or newer to support 16 KB memory pages. This is a memory page size, not a file size — nothing needs to be made smaller. Native libraries must be laid out so the system can map them on a device whose page size is 16 KB.

Status of this release, verified by loading each library on a real Android 15 device with a 16 KB page size and inspecting the memory permissions applied:

Native library	64-bit (arm64-v8a)	Notes
`libModuleAPI.so`	Ready	Built with the correct 16 KB linker setting.
`libpower.so`	Ready	Built with the correct 16 KB linker setting.
`libSerialPortHc.so`	Not ready	Still uses a 4 KB layout. See below.

> **One library is still outstanding**
>
> `libSerialPortHc.so` is a prebuilt library that provides serial port access and handheld power-rail control. On a 16 KB device it loads without an error but its code is mapped non-executable, so the application fails the first time it calls into it.
>
> This library must be rebuilt with `-Wl,-z,max-page-size=16384`. It cannot be corrected by editing the file: the fix changes the memory layout, which only the linker can do. Contact Identium support for the status of the rebuilt library.
>
> Impact: applications built on this release run correctly on CX1500N handheld hardware, which uses 4 KB pages. The limitation affects submission to Google Play and any future 16 KB device.

32-bit (armeabi-v7a) libraries are exempt — devices with 16 KB pages are 64-bit only.

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3. Requirements

Item	Version
Android	5.0 (API 21) minimum; API 22 or newer recommended
Android Gradle Plugin	8.x (the SDK is built with 8.11.0)
compileSdk	34
JDK	17
ABIs	arm64-v8a, armeabi-v7a
Android NDK	Not needed — the native libraries are prebuilt inside the AAR

> **The UHF module is real hardware**
> The module is reached over a serial port and GPIO lines. The SDK works on CX1500N handheld hardware; it does not run on an emulator or on a standard phone or tablet.

4. Adding the SDK to your application

Copy `IdentiumCX1500N.aar` into your module's `libs/` folder, then declare it:

```
android {
    defaultConfig {
        minSdk 22
        ndk { abiFilters 'arm64-v8a', 'armeabi-v7a' }
    }
}

dependencies {
    implementation files('libs/IdentiumCX1500N.aar')          // the only SDK dependency
    implementation 'androidx.appcompat:appcompat:1.7.0'
    implementation 'com.google.android.material:material:1.12.0'
}
```

Add the permissions your application actually needs. Storage permissions are only required if you export scan data to external storage:

```
<uses-permission android:name="android.permission.READ_EXTERNAL_STORAGE"
                 android:maxSdkVersion="32" />
<uses-permission android:name="android.permission.WRITE_EXTERNAL_STORAGE"
                 android:maxSdkVersion="29" />
```

5. Basic usage

Everything goes through the `UHFReader` singleton. Connect once (on a background thread), register a listener, then start and stop inventory as needed.

```
// Connect to the module (blocks 1–6 s: run on a background thread)
UHFReaderResult<Boolean> r = UHFReader.getInstance().connect();
if (r.getResultCode() == UHFReaderResult.ResultCode.CODE_SUCCESS) {

    // India: 865–868 MHz band
```

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```
    JHFReader.getInstance().setFrequencyRegion(0x08);

    // Tags arrive on a background thread – marshal to the UI thread before
    // touching any view.
    JHFReader.getInstance().setOnInventoryDataListener(tags -> {
        runOnUiThread(() -> showTags(tags));
    });

    JHFReader.getInstance().startInventory();
}

// ... later
UHFReader.getInstance().stopInventory();
UHFReader.getInstance().disConnect();
```

> **Inventory callbacks run on a background thread**
>
> The listener is invoked from the SDK's own reader thread, not the main thread. Do not update views directly from it, and keep the callback short — a slow callback reduces read throughput.

Protocol parameters — session, target, Q and the RF link profile — are module settings, not per-command arguments. They take effect immediately and the module keeps them until it loses power, at which point it reverts to the values stored in its flash. Re-apply them after every power cycle, or store them in the module flash. `docs/SDK-Developer-Guide.md` explains the RF link profiles, persistence and the full API.

6. Demo application

Install the demo on the handheld and use it to check the reader and to see each API in action:

```
adb install -r IdentiumCX1500N-Demo_2.9.apk
```

The demo connects to the module on start and offers inventory, read/write, lock/kill, tag locating by signal strength, LED tags, configuration (power, band, session, Q, RF link) and an antenna VSWR test. In India select the EUR band (region `0x08`, 865–868 MHz).

7. Verifying 16 KB support yourself

If you rebuild any native library, or receive an updated one, verify it before shipping. Checking the declared alignment alone is not sufficient — a library can report 16 KB alignment and still fail to load. Three conditions must all hold:

- The declared alignment of every loadable segment is at least 16 KB.
- Each segment's file offset is consistent with its address in memory — otherwise the library is mapped out of position and fails to load.
- No two segments share a 16 KB page. If they do, code and data get one set of memory permissions and the library's code can end up non-executable. This is the case that loads successfully and crashes later.

`check16k.py`, included in this package, checks all three. Unzip the AAR (or the APK) and point it at the native library folder:

```
unzip IdentiumCX1500N.aar -d aar
python3 check16k.py aar/jni            # exit status 0 = all libraries pass
```

To confirm on a real system, create an emulator from an Android 15 or newer system image whose name includes *16 KB Page Size*, and check:

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```
adb shell getconf PAGE_SIZE                # must print 16384
```

8. Troubleshooting

Symptom	Likely cause
Connect fails on a handheld	The module is powered down, or another application already holds the serial port. Disconnect cleanly before leaving your activity. See the FAQ in the developer guide.
Crash when the application starts reading, on a 16 KB device	The libSerialPortHc.so limitation in section 2. Expected until the rebuilt library arrives.
Nothing works on an emulator	Expected. The SDK needs the handheld's serial port and GPIO lines.
Settings are lost after the module is power cycled	Protocol parameters live in module RAM. Re-apply them on reconnect, or store them in the module flash.
No tags in India	Set the region to 0x08 (865–868 MHz band).
Google Play rejects the upload for 16 KB support	See section 2. A rebuilt libSerialPortHc.so is required.

9. Support

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When reporting an issue, please include the handheld model, the Android version, the SDK version above, and a logcat capture covering connect and the failing operation.

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