RN00401

Android 16 MW Release notes for PN722x/PN716x

Rev. 1.0 — 18 November 2025 **Release notes**

Document information

Information	Content
Keywords	PN722x, PN716x, Android 16
Abstract	Contains information about the release content of Android 16 MW for PN722x/PN716x.

1 Document purpose

The purpose of this document is to provide information on the content of the Android 16 MW based on PN7220/PN7221 and PN7160/PN7161 product versions.

2 Middleware version history

The tables below shows the version history of the Android MW releases:

Table 1. Android 16 MW version history

MW version history	Link to release version
NFC_AR_INFRA_001E_16.01.00	Section 3.1 "NFC_AR_INFRA_001E_16_01_00"

Table 2. Android 15 MW version history

MW version history	Link to release version
NFC_AR_INFRA_001E_15.03.01	RN00305
NFC_AR_INFRA_001E_15.03.00	RN00305
NFC_AR_INFRA_001E_15.02.00	RN00305
NFC_AR_INFRA_0006_15.01.01	RN00305
NFC_AR_INFRA_001E_15.01.00	RN00305

Table 3. Android 14 MW version history

MW version history	Link to release version
NFC_AR_INFRA_001E_14.04.00	RN00304
NFC_AR_INFRA_001E_14.03.00	RN00304
NFC_AR_INFRA_001E_14.02.00	RN00304
NFC_AR_INFRA_001E_14.01.00	RN00304

Table 4. Android 13 MW version history

MW version history	Link to release version
NFC_AR_INFRA_001E_13.21.00	Coming soon. NXP is improving the release note documents.
NFC_AR_INFRA_001E_13.20.00	Coming soon. NXP is improving the release note documents.
NFC_AR_INFRA_0004_13.04.00	Coming soon. NXP is improving the release note documents.

3 Android 16 MW releases

3.1 NFC_AR_INFRA_001E_16_01_00

This release has not been fully validated. It is an early release to customers that can start the integrations. It must not be used in production.

3.1.1 Release content

- Android version migration from Android-15 to Android-16
  - Synced with GPP tag: android-16.0.0_r2
  - Nfc packaged as APEX (replacing APK & libraries)
  - Migrated to NFC HAL AIDL 2.0
    - NXP T4T APIs deprecated → Switched to AOSP T4T APIs, API adaptation needed at customer side
    - Update T4T config per AOSP for enable/disable
  - Updated T3BT & Chinese ID TAG configs as per Android16 AOSP
  - NXP framework modules moved to NFC APEX (due to system API access restrictions).
    - Will be reverted in Android-17 with mainline architecture
  - Kernel version upgraded from 6.6 to 6.12.

3.1.2 Test environment

Table 5. Test environment for PN7220/PN7221:

Parameters	Values
Board used	DragonBoard 845c + PN7220/PN7221 Customer evaluation board PNEV7220 BP1 ref.[2] and PNEV7220 BP2 ref.[3] with PN7221 IC
I^2C speed	1 MHz on DragonBoard 845c
Android version	16
MW version	NFC_AR_INFRA_001E_16.01.00
Clock configuration	XTAL
Firmware version	Internal version is used for testing.

Table 6. Test environment for PN7160/PN7161:

Parameters	Values
Board used	DragonBoard 845c + PN7160/PN7161 Customer evaluation board PNEV7160 ref.[1] with PN7161 IC
I^2C speed	1 MHz on DragonBoard 845c
Android version	16
MW version	NFC_AR_INFRA_001E_16.01.00
Clock configuration	PLL
Firmware version	12.50.11

3.1.3 Android MW memory size

Note: *Memory sizes are based on the used development platform, compiler and settings. Sizes can be different on customer site.*

Table 7. NFC libraries memory consumed

Library	Text (bytes)
nfc_nci_nxp_pn72xx.so	237770
android.hardware.nfc@1.0.so	155836
android.hardware.nfc@1.1.so	164833
android.hardware.nfc@1.2.so	109617
libnfc_nci_jni.so	854529
libnfc-nci.so	1044175
nfc_nci_nxp.so	186848
nfc_tda.so	37317
vendor.nxp.nxpnfc@1.0.so	67966
vendor.nxp.nxpnfc@2.0.so	88470
emvco_poller.so	88491
vendor.nxp.emvco-V1-ndk.so	120999
emvco_tda.so	37157
emvco_ecp_vas.so	1537
vendor.nxp.emvco-V2-ndk.so	120840

4 Recommendations, known limitations, and precautions

4.1 PN722x customer eval board

- In PN722x customer eval BP2 board used for Dual CPU use case, Android host shall use HIF2-I2C (I2CM follower) Interface of PN722x. By design this interface is not possible to be used as a wake-up reason from Standby.
  - **Solution**: GPIO3 of PN722x needs to used as a wake-up signal. By connecting HIF2-I2C SCL line to GPIO3, any HIF activity will be used as wake-up of PN722x.
- The Secure MCU mode switch application is only for reference purpose. Any negative testing scenarios using this application may result in ambiguous behavior.

4.2 Android MW

Table 8. Recommendations and precautions

Name	Description
EMVCo middleware	EMVCo middleware KPI values are not guaranteed in Android as Android thread scheduling varies every time based on other background threads running on the system. It is recommended to run the EMVCo stack in a trusted environment to ensure consistent thread scheduling and achieve the optimized KPI value. EMVCo Stack is implemented fully in native mode and it is thread-safe to ensure critical timings once the thread is scheduled.
Secure MCU mode	The Secure MCU mode switch application is only for reference purposes. Any negative testing scenarios using this application may result in ambiguous behavior.
Contactless interface and standby current	To use only the contactless interface and achieve the best standby current (LPCD average current), it is advised to remove/delete the *xxx.so* file from the Android installation, which disables the NFC CT feature. • **Solution**: Remove the NFC tda library (*nfc_tda.so*) from the *system/lib64* path.

Table 9. Known issues of Android MW

Issue	Customer impact	Description/Solution	Effected FW releases
For NFC-V poll mode, test cases failed in Android 16 NFC Forum test. After 5 consecutive Auto NDEF detection failures, RF gets stuck and RF discovery does not restart.	NFC Forum test cases fail.	Restart the DTA app. Re-run the test suite to ensure NFC Forum compliance	NFC_AR_INFRA_001E_16_01_00
Post Factory Reset of Device, Failed to Discover SAM and CT as part of NFC INIT	No functional impact	If an NFC TDA app is trying to discover SAM, it is working as expected after NFC INIT.	NFC_AR_INFRA_001E_16_01_00
During NFC INIT, CT Discovery command request			NFC_AR_INFRA_001E_16_01_00

Table 9. Known issues of Android MW*...continued*

Issue	Customer impact	Description/Solution	Effected FW releases
response should not be Present for I2CMS			
During NFC INIT, NCI_ ANDROID_GET_CAPS_ CMD gets Rejected from Firmware with a Syntax error.	No functional impact	This is a new requirement and yet to be implemented in the RFP release	NFC_AR_INFRA_001E_16_ 01_00
Mode Set disable command is not sent after the core connection is closed in a negative scenario.	No functional impact	This can happen only if an APDU exchange failed with transmission error. It will recover on NFC reset.	NFC_AR_INFRA_001E_ 16_01_00 and older tags for Android 13, Android 14, Android 15
FW Download Status failed in SmcuSwitch app.	Expected behavior as per current implementation. But the implementation is incorrect.	The app status need to be corrected.	NFC_AR_INFRA_001E_ 16_01_00 and older tags for Android 14, Android 15

4.3 PN722x NFCC

- Limitation:
  - Incompliance to Digital CT EMVCo 4.3d specs – 4 test failures related to handling of CWT & EGT where both values are same (i.e. min = max) – TC_1800.DTS112, TC_1800.DTS113,TC_1800.DTS212 and TC_1800.DTS213 test cases fail
- Cautions/Recommendations:
  - It is advised not to disable the DPC as It may damage TX drivers due to overcurrent.
  - Firmware updates shall be done in a stable power supply condition, otherwise a full firmware download can be required. Therefore it is recommended to not interrupt the FW update procedure.

4.4 Precautionary notes

Table 10. Precautions and recommendations

Limitation	Recommendation
TX driver may be damaged due to overcurrent.	Do not disable DPC on PN7220.

5 Features, certifications, and applications supported in releases

To achieve all below mentioned things, users need to check the test environment chapter of the MW version in use and check with which settings the below results were achieved (see Section 3 "Android 16 MW releases").

The results in the tables below can be achieved with all minor versions releases on Android 16.

Table 11. RF features list

Mode	Protocol	Techno	NFCEE	Other	Completeness
R/W – NFC Forum	ISO-DEP	NFC-A	DH	Frame RF IF 106 kB/s	Functional verified
				ISO-DEP RF IF 106 kB/s	Functional verified
				ISO-DEP RF IF 212, 424, 848 kB/s	Functional verified
		NFC-B	DH	Frame RF IF 106 kB/s	Functional verified
				ISO-DEP RF IF 106 kB/s	Functional verified
				ISO-DEP RF IF 212, 424, 848 kB/s	Functional verified
	MIFARE Cl.	NFC-A	DH	TAG-CMD IF 106 kB/s	Functional verified
	T2T	NFC-A	DH	Frame RF IF 106 kB/s	Functional verified
				TAG-CMD IF 106 kB/s	Functional verified
	FeliCa / T3T	NFC-F	DH	Frame RF IF 212, 424 kB/s	Functional verified
	ISO 15693	ISO 15693	DH	Frame RF IF 26, 53 kB/s	Functional verified
R/W – EMVCo Mode	ISO-DEP	NFC-A	DH	ISO-DEP RF IF 106 kB/s	Functional verified
		NFC-B	DH	ISO-DEP RF IF 106 kB/s	Functional verified
	FeliCa / T3T	NFC-F	DH	Frame RF IF 212, 424 kB/s	Functional verified
Card Emulation	ISO-DEP	NFC-A	HCE	ISO-DEP RF IF 106 kB/s	Functional verified
				ISO-DEP RF IF 212, 424, 848 kB/s	Functional verified

Table 12. Other FW features released

Sl.no	Feature	Completeness
1	Secure FW download	Functional verified
2	Mode Switch GPIO	Functional verified
3	Standby mode	Functional verified
4	PRBS	Functional verified
5	Contact Interface support using ISO7816 Interface	Functional verified
6	Dynamic Power Control (DPC)	Functional verified
7	External DC-DC support	Functional verified
9	Automatic Waveshape Control	Functional verified
10	LPCD - Tag detector	Functional verified
11	Clock management (PLL / XTAL)	Functional verified

Table 13. Other MW features released

Sl.no	Feature
1	Firmware downloads through Android
2	EMVCo Discovery Profile -> Type A,B, and F (Prop tech) Technology polling Enablement
4	NFC Discovery Profile -> Type A, B, F, and V Technology polling Enablement
5	Discovery Mode Switch between NFC and EMVCo Profiles
6	Proprietary commands Support
7	HIF1-I2C interface support
8	Contact interface support for NFC and EMVCo

Table 14. Android PSP released

Sl.no	Feature
1	EMVCo loopback application for Digital and analog Compliance
2	EMVCo Transac A and B application for analog Compliance
3	EMVCo Interop application
4	Configuration tool to update EEPROM and Protocol Area of PN7220
5	Self-test APK
6	EMVCo loopback application for CT Compliance
7	NFC reference application to test SAM card on contact interface
8	Secure MCU switch application to switch between SMCU and Android Host

Table 15. Secure MCU PSP released

Sl.no	Feature
1	EMVCo Contactless loopback application for Digital and analog Compliance
2	EMVCo Contactless Transac A and B application for analog Compliance
3	EMVCo Contactless Interop application
4	EMVCo Contact loopback application for CT compliance
5	Secure MCU application to update the PN722x FW

Table 16. Certifications

Sl.no	Feature	Completeness
1	NFC Forum CR13 - Digital Compliance (Internal)	Functional verified
2	NFC Forum CR13 - Analog Compliance (Internal)	Functional verified
3	EMVCo 3.0 L1 Digital Compliance (Internal)	Functional verified
4	EMVCo 3.0 L1 analog Compliance (Internal)	Functional verified
5	EMVCo 4.3d L1 CT Compliance (Internal)	Functional verified

6 Abbreviations and acronyms

Table 17. Abbreviations

Acronym	Description
FW	FirmWare
GMS	Google Mobile Service
MW	MiddleWare

7 References

[1] Webpage – PN7160-EVK – Development Kits for PN7160 Plug'n Play NFC Controller (link)

[2] Webpage – PNEV7220BP1 – Development Board for PN7220 NFC Controller for EMVCo and NFC Forum Operation (link)

[3] Webpage – PNEV7220BP2 – Development Board for PN7220 NFC Controller with Two Host Configuration (link)

8 Revision history

Table 18. Revision history

Document ID	Release date	Description
RN00401 v.1.0	18 November 2025	• Initial version.

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