AN

NFC DTA APK Setup Guide

Rev 2.6 – 2022 Aug 08 **Application Note**

Document information

Info	Content
Keywords	NFC, Android, DTA APK
Abstract	This document provides information on how to use NFC DTA APK on Android platform to validate NFC Forum compliance test cases.

Revision history

Rev	Date	Description
1.0	2014-07-07	Initial version
1.1	2014-07-24	Update for Sec 4 (For apk installation) & 4.1 (removed port permissions)
1.2	2014-08-28	Update with DTA 5.2 version for all screen shots, added DTA supported features in selection 3 & 4.2.3 selection for Analog. Added screen timeout settings in section 4.0
1.3	2014-09-05	Updated 3.2 Wave-II testing. Added section 4.3.1 for LLCP testing. Added section 4.3.2 for SNEP testing. Limitation note on SNEP testing.
1.4	2014-09-12	Updated SNEP UI Changes and removed DEP(I) & DEP(T) radio buttons in Wave-II in DTA main screen.
1.5	2014-09-16	Updated SNEP testing scenario. Config file changes required for testing SNEP
1.6	2014-11-14	Updated background color in DTA main screen and Removed Initializing status screen.
1.7	2014-11-28	Updated with DTA UI with ESE in Card Emulation, UI version in Device Info and DTA Automation for Micropross Tool. SNEP UI for SNEP client message and server message.
1.8	2015-04-01	Updated GUI for selection of features for RF technologies for A, B, F in Poll & Listen mode. Added option to enable/disable parameters in Connect PDU in LLCP.
1.9	2015-11-10	Removed additional configurations to be done for SNEP as it is handled automatically.
2.0	2016-08-25	Updated DTA UI for selection of CR8/CR9. Certification Release (CR). Added UI toast messages for CR9 HCE NFC-F test case configuration.
2.1	2016-11-18	Updated DTA UI for CR9 with Time Slot Number (TSN-F) & Connection Device Limit.
2.2	2017-06-27	Updated DTA UI for CR10 to CR12 with Time Slot Number (TSN-F) & Connection Device Limit.
2.3	2018-03-08	Editorial changes & added Connection Device Limit zero DTA UI in the DTA APK.
2.4	2021-07-14	Updated DTA UI for CR12, Dynamical selection of Certifications from UI & Active Peer to peer enable.
2.5	2021-11-18	Removed unused UI screenshot.
2.6	2022-08-08	Updated DTA UI for CR13, Support added for pattern number 0x1241 & 0x1281 for CR12 & CR13

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1. Introduction

Device Test Application (DTA) that a vendor can integrate in an NFC Forum Device to ensure that the Implementation/Device Under Test (IUT/DUT) can be tested against the NFC Digital Protocol Technical Specification [DIGITAL], NFC Forum Type 1-5 Tag Operation Specifications [T*n*TOP], NFC Forum Analog RF, LLCP and SNEP.

DTA APK is designed to work with NCI based NFC chipsets. This setup guide provides the detailed directions about setting up NFC DTA apk for NFC Forum Compliance Testing of Implementation Under Testing (IUT) or Device Under Testing (DUT).

2. Scope

This document is written considering NFC DTA apk setup guidelines to perform the NFC Forum compliance validation of Implementation Under Testing (IUT) or Device Under Testing (DUT).

3. Architecture of NFC DTA APK

Figure 1 shows the architecture of NFC DTA APK.

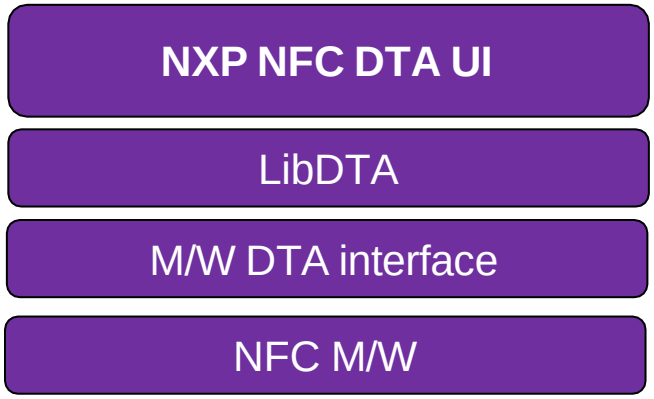


Figure 1: NFC DTA APK Architecture

NFC DTA supported Features:

A NFC device may support one or more communication technologies: Type A, B and F, in both Poll & Listen modes.

3.1 Testing Scope

- NFC Forum Digital protocol test cases.
- NFC Forum T1T(only for CR8 to CR12), T2T, T3T & T4T, T5T test cases
- NFC Forum Analog RF.
- NFC Forum LLCP (only for CR8 to CR11)
- NFC Forum SNEP(only for CR8 to CR11)

4. NFC DTA APK setup

Following commands need to be executed on the terminal to install the apk & supporting files.

Configuration file:

```
adb wait-for-device
adb root
adb wait-for-device
adb remount
adb shell rm -rf /data/app/NxpDTA/
adb shell mkdir /system/app/NxpDTA
adb push libosal.so /system/lib64/
adb push libmwif.so /system/lib64/
adb push libdta.so /system/lib64/
adb push libdta_jni.so /system/lib64/
adb push NxpDTA.apk /system/app/NxpDTA/
adb reboot
```

After updating the required files the “NXP Device Test Application” appears in the main menu.

Figure 2 shows the installed DTA apk in the main menu.

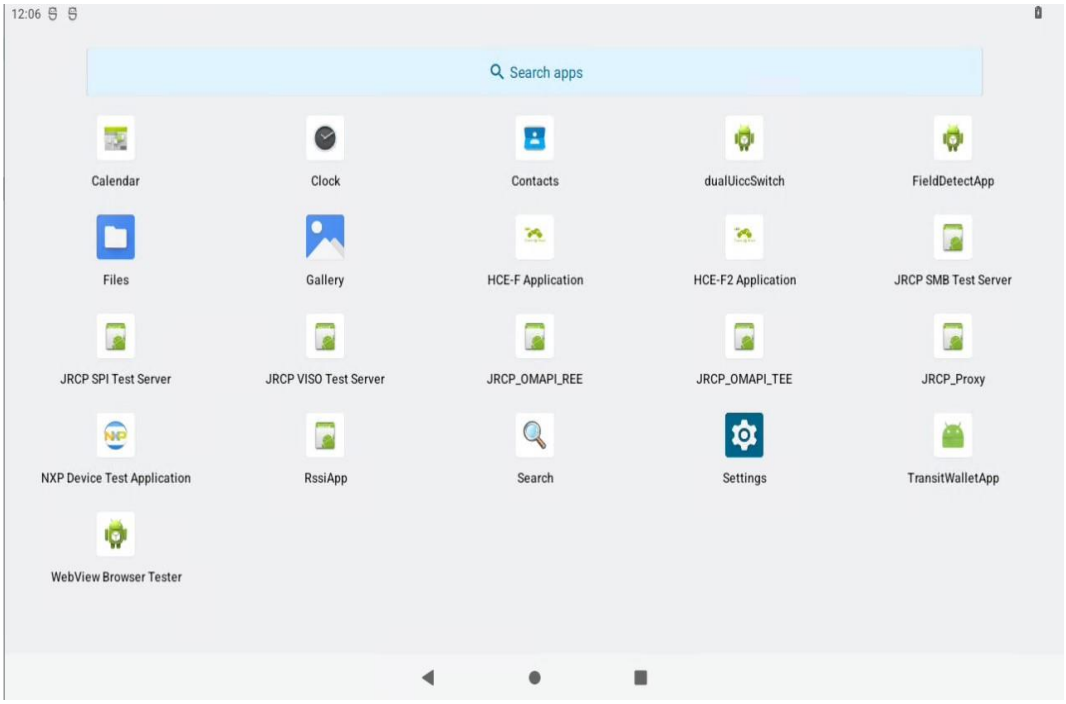


Figure 2: DTA APK installed in Android

Before running DTA APK

Switch off the NFC service option in Settings, Settings->Connected devices -> Connection preferences ->NFC as Off and reboot the device (using 'adb reboot').

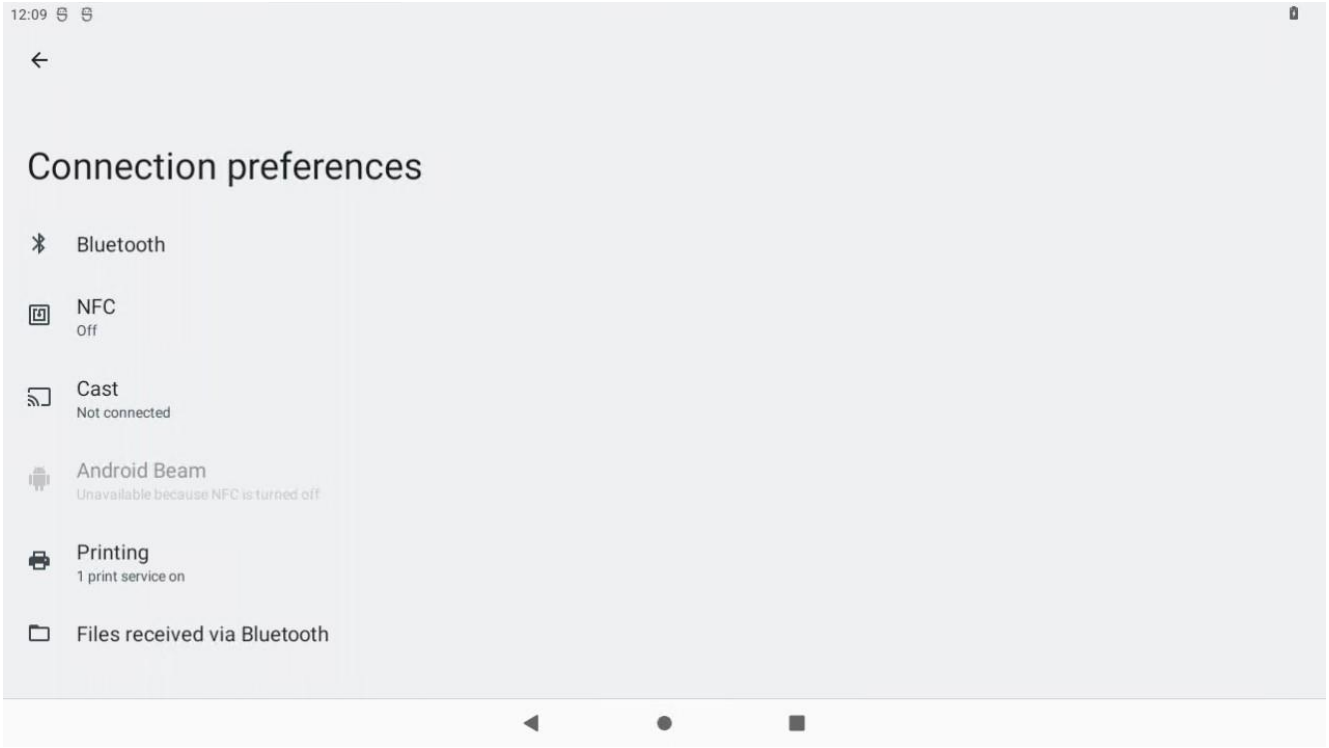


Figure 3: NFC service OFF in settings

Screen time out settings

Screen time out should be updated in the IUT settings to avoid the DTA RF signal loss. Because once the device goes to sleep mode, immediately RF will be stopped from device, to avoid this device screen timeout should be increased to 30 minutes or device should powered.

The following path can be used for updating the screen timeout setting.

Main menu-> Settings -> Display -> Screen timeout -> select 30 minutes.

4.1. Running DTA APK with options

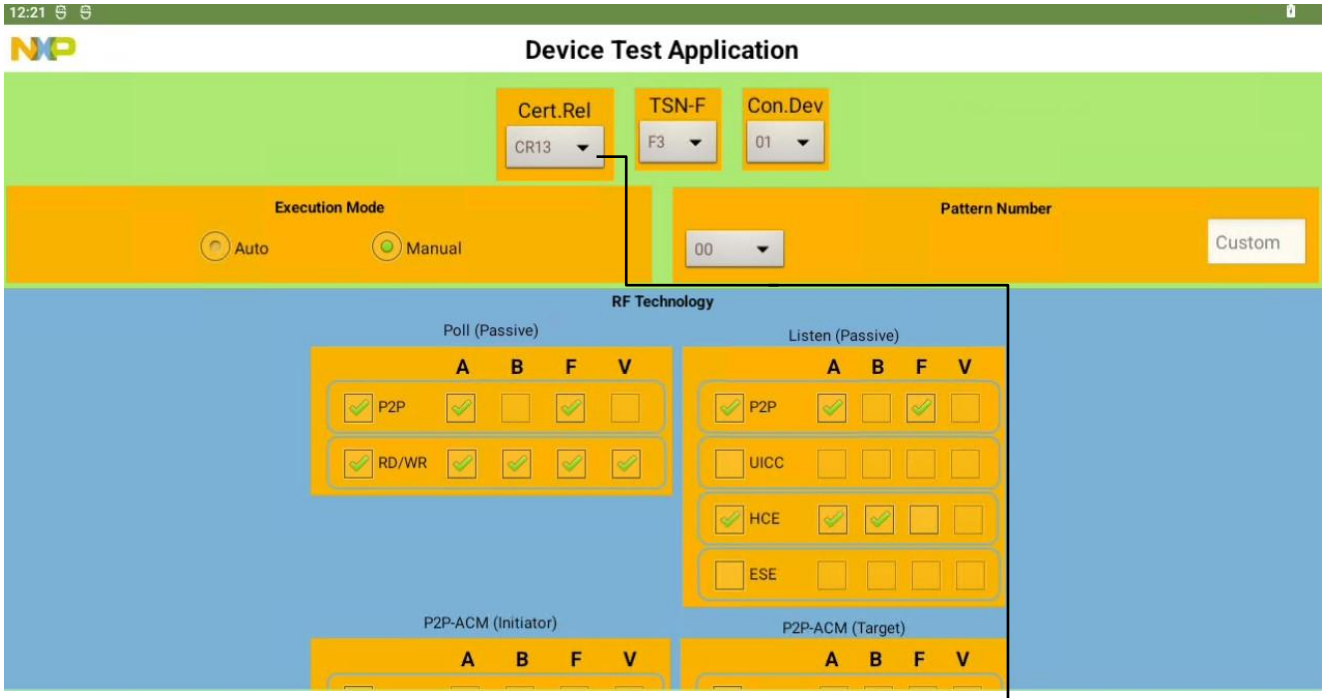
4.2.1 NXP_DTA_UI_SCR_SCENERIO_01: Default screen

The default screen is loaded as soon as the application is launched. By default Certification Release CR13 with Time Slot Number for NFC-F Technology (TSN-F) with value F3, Connection Device Limit with 01 & Manual mode is selected and the pattern number will be set to "00" in multi option. The user has the option to enter custom pattern number. By default A & F RF Technologies for P2P & A,B,F,V RF Technologies for RD/WR will be enabled for Poll. By default A & F RF Technologies for P2P will be enabled in Listen mode. Device information will not be displayed in the default screen.

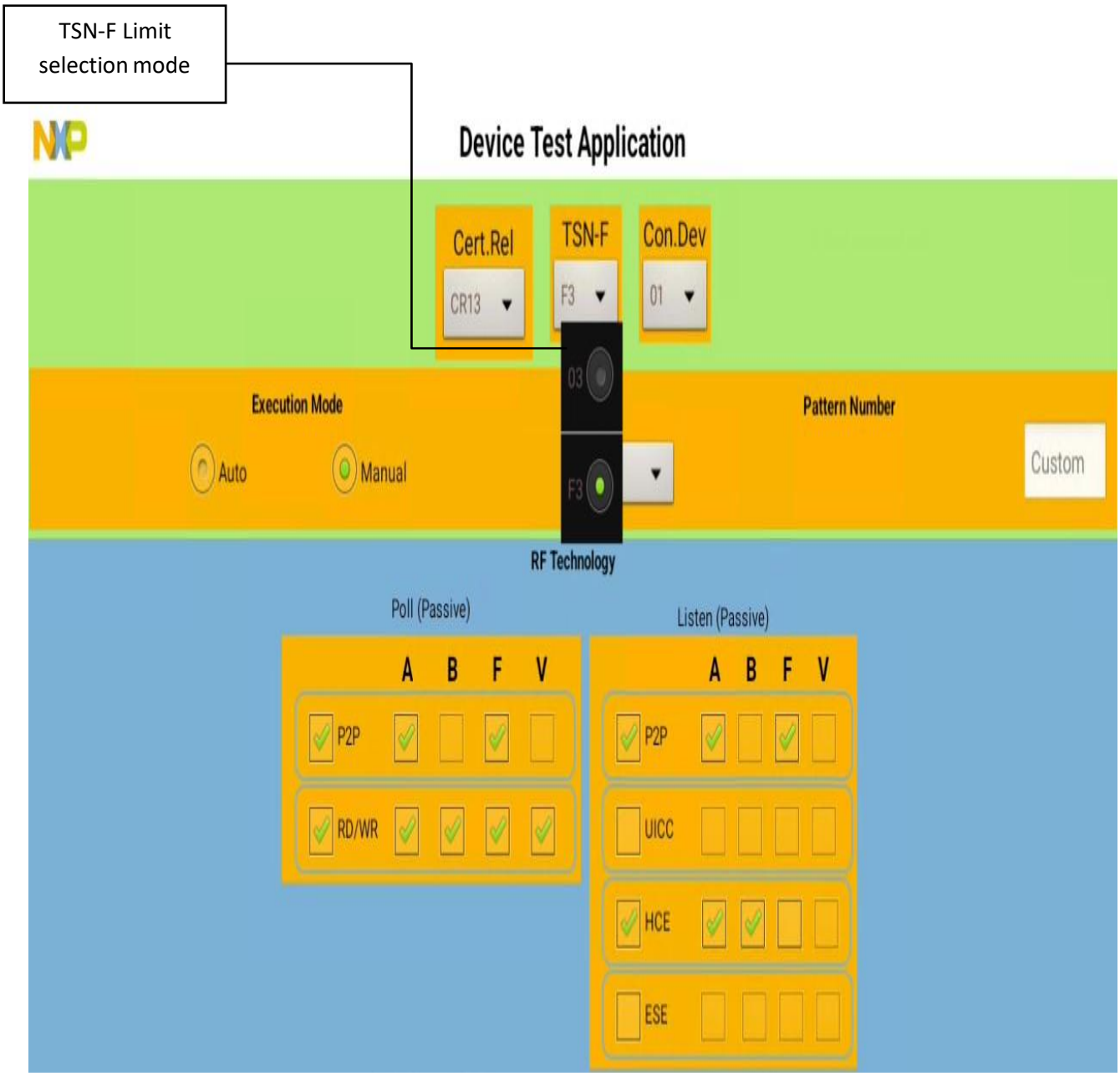
The **current status** of the application is **Stopped** and the text color is in red.

The **RUN** button in **GREEN** color, **STOP** button in **GRAY** color and **EXIT** button in **orange** color.

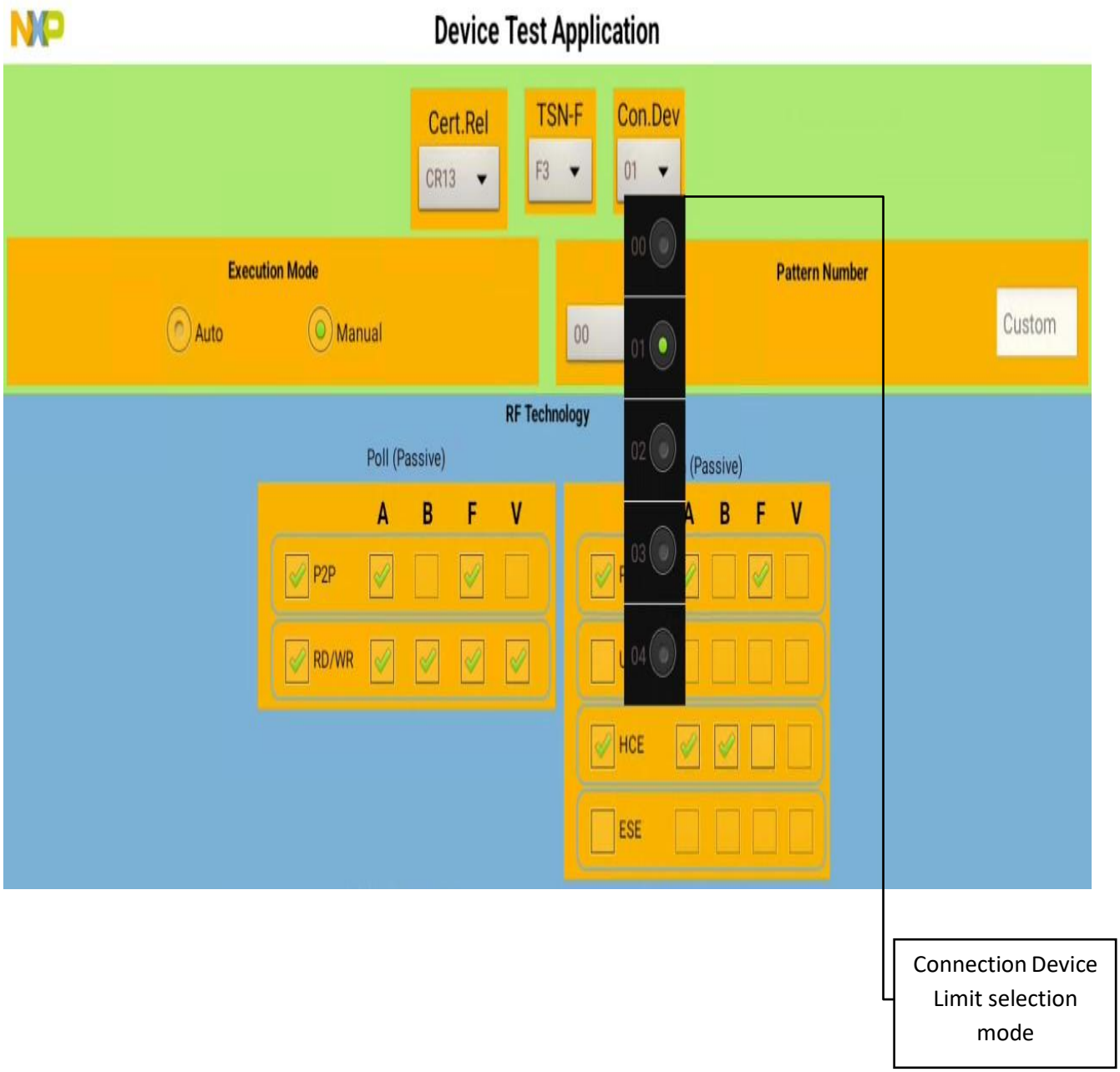
In manual mode check boxes Custom Message and Show Message are disabled. Copyright and UI Version are showed in the bottom.

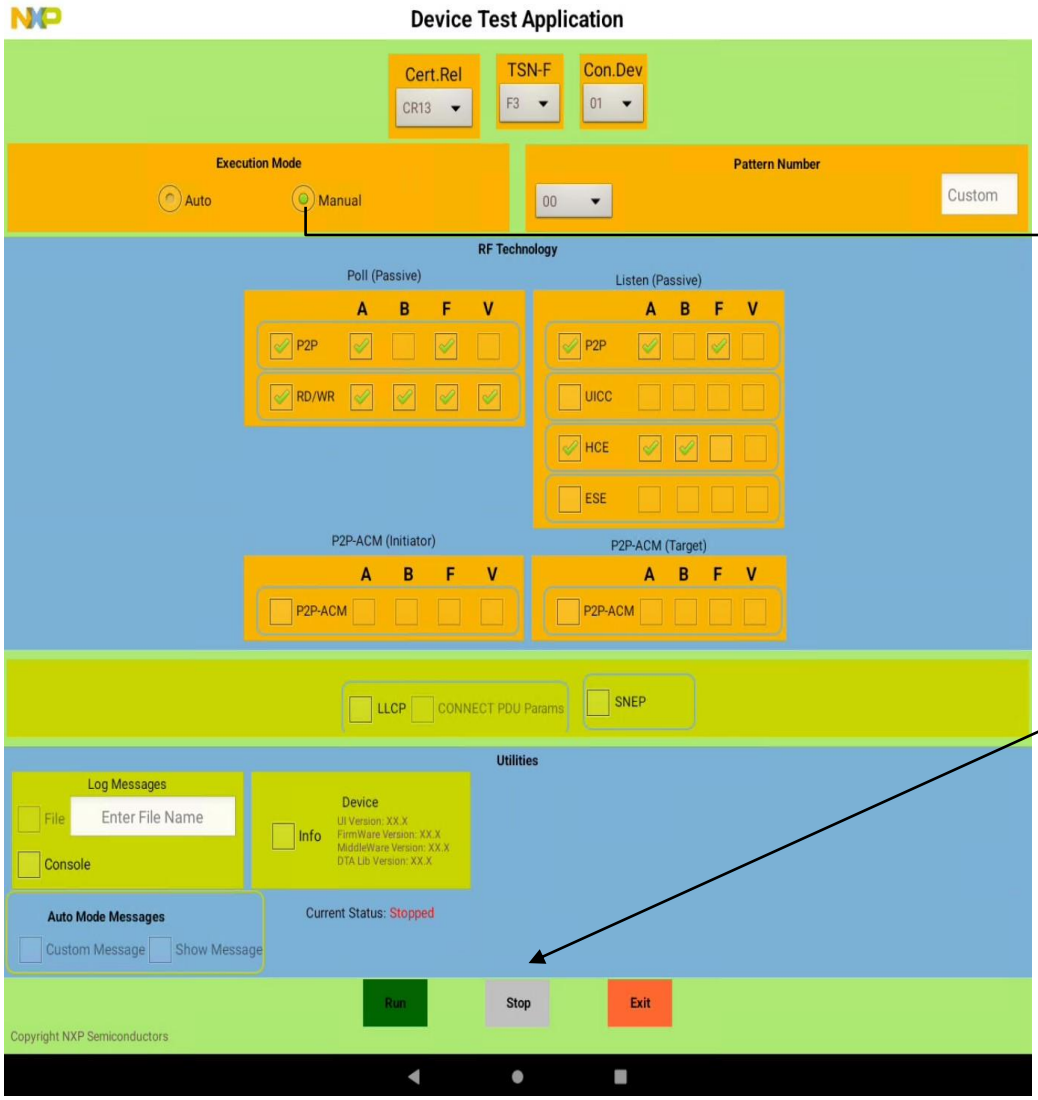


CR8/CR9/CR10/CR11/CR12/CR13 Certification Release selection mode


TSN-F Limit selection mode
Device Test Application
Cert.Rel
CR13
TSN-F
F3
Con.Dev
01
Execution Mode
Auto
Manual
03
F3
Pattern Number
Custom
RF Technology
Poll (Passive)
A B F V
P2P
RD/WR
Listen (Passive)
A B F V
P2P
UICC
HCE
ESE

Before running the DTA application select Connection Device Limit Con.Dev to value 01.





Manual mode selected by default

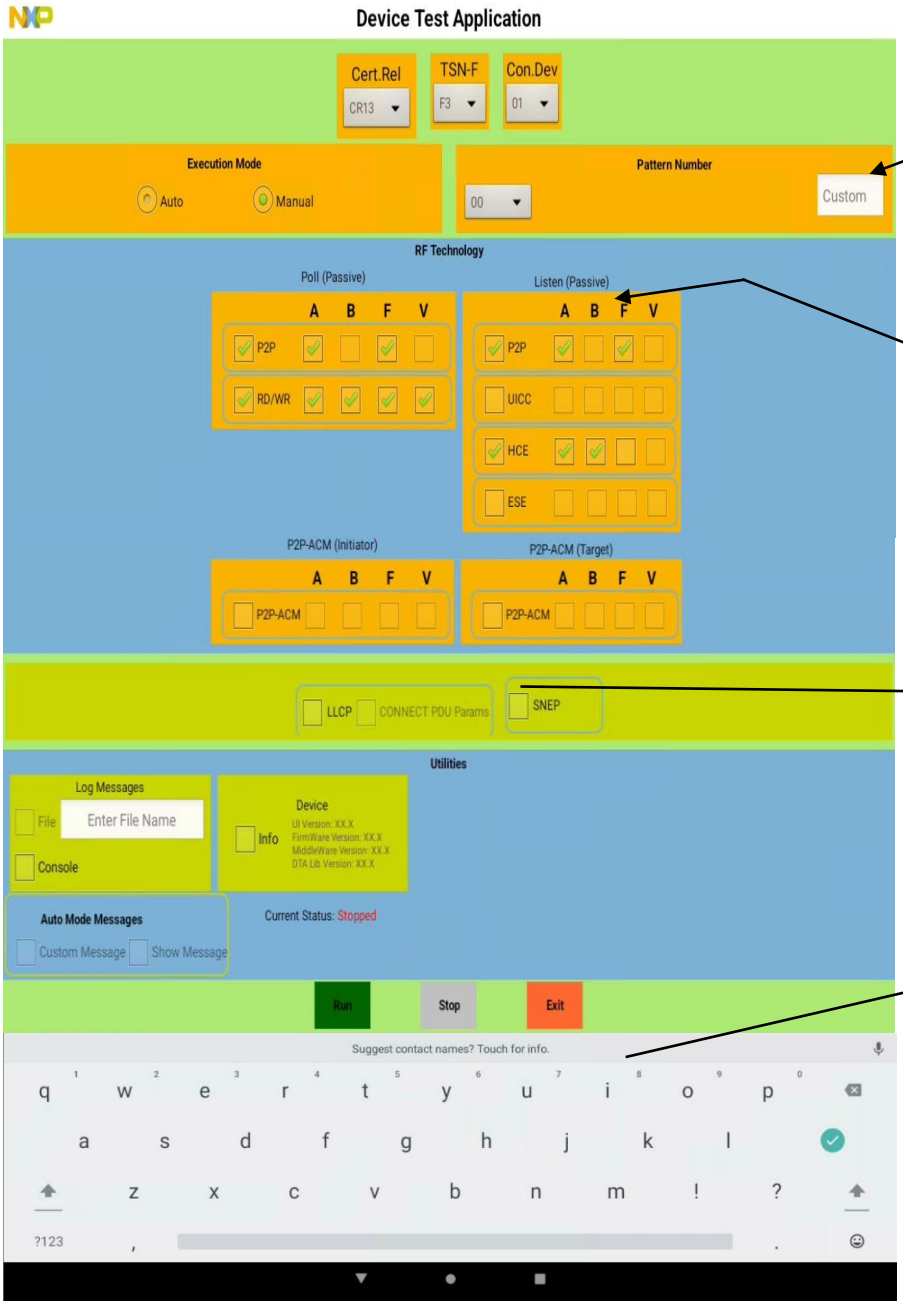
Run, Stop, Exit Button

4.2.2 NXP_DTA_UI_SCR_SCENERIO_02: Selections in Manual Mode

This screen is similar to “NXP_DTA_UI_SCR_SCENERIO_01” screen with the changes shown based on the user selection.

The custom pattern number is entered as 0000. Multi pattern number if selected will get cleared. Need to enter hexadecimal pattern number without the prefix 0x. Only 0000 to ffff is allowed to enter. Other entry will show pop-up message as shown in the. Maximum number of bytes allowed is only 4. As soon as the user touches in the custom pattern number box, the keypad pops up as shown in the screen.

Below are RF Technology options available for selection in Poll & Listen mode. In Poll Mode P2P and RD/WR modes are allowed to select. However enabling one technology in one of the poll modes will enable the same technology in other poll mode. Listen mode P2P, UICC , HCE and ESE are allowed to select. In LLCP , parameters in CONNECT PDU is allowed to select .



Multi Patten number is cleared

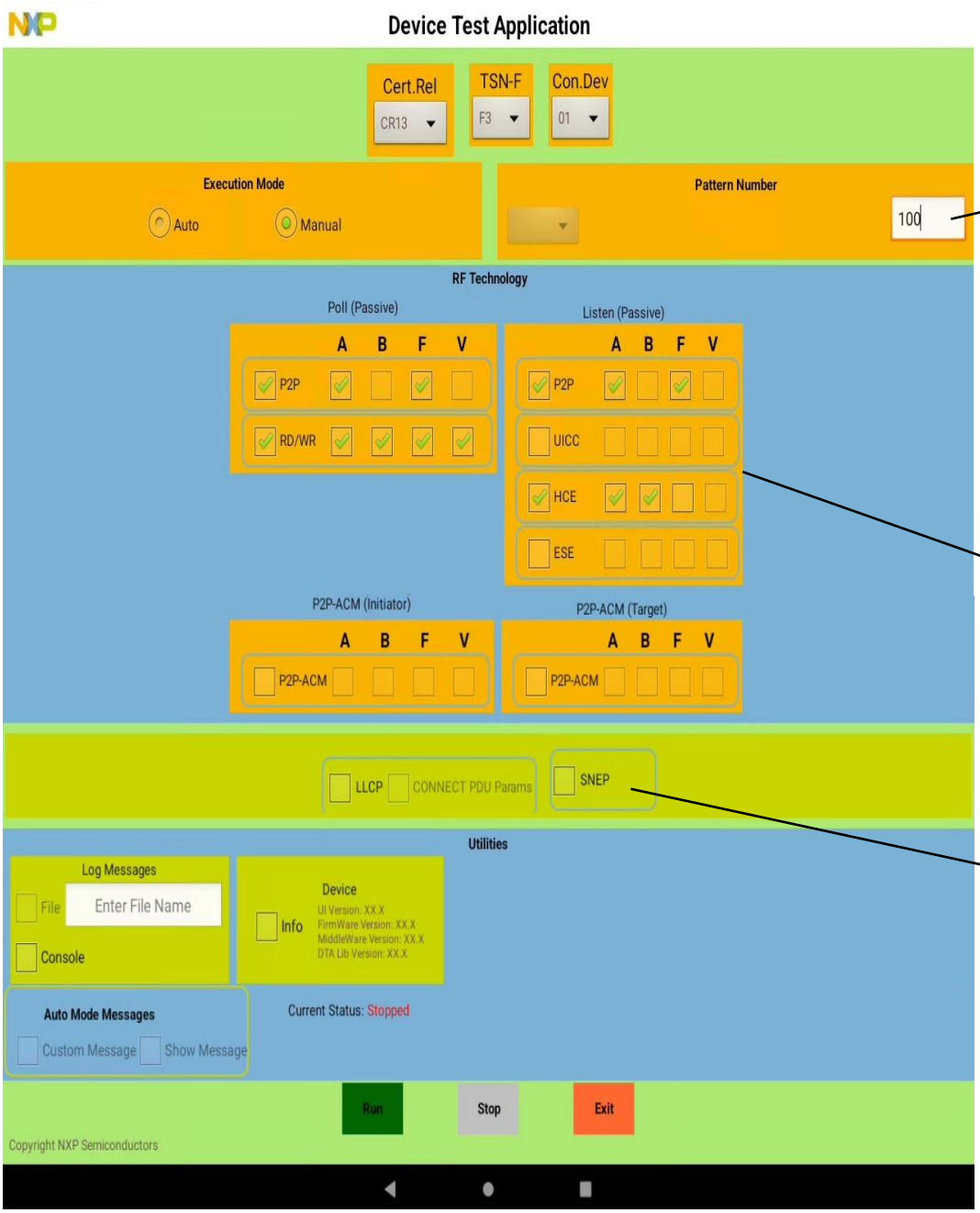
A & F RF Technologies can be selected in both Poll & Listen Modes

Either LLCP or SNEP can be selected at a time.

Keypad pops up

4.2.3 NXP_DTA_UI_SCR_SCENERIO_02: Analog Selection in Manual Mode

First select the CE mode with UICC. The custom pattern number is entered as 1000 and press RUN button then the application will start running in manual mode. The current status will be changed to first **Running** and the text color is in green. Now, all the selections are disabled.



Custom pattern number is entered

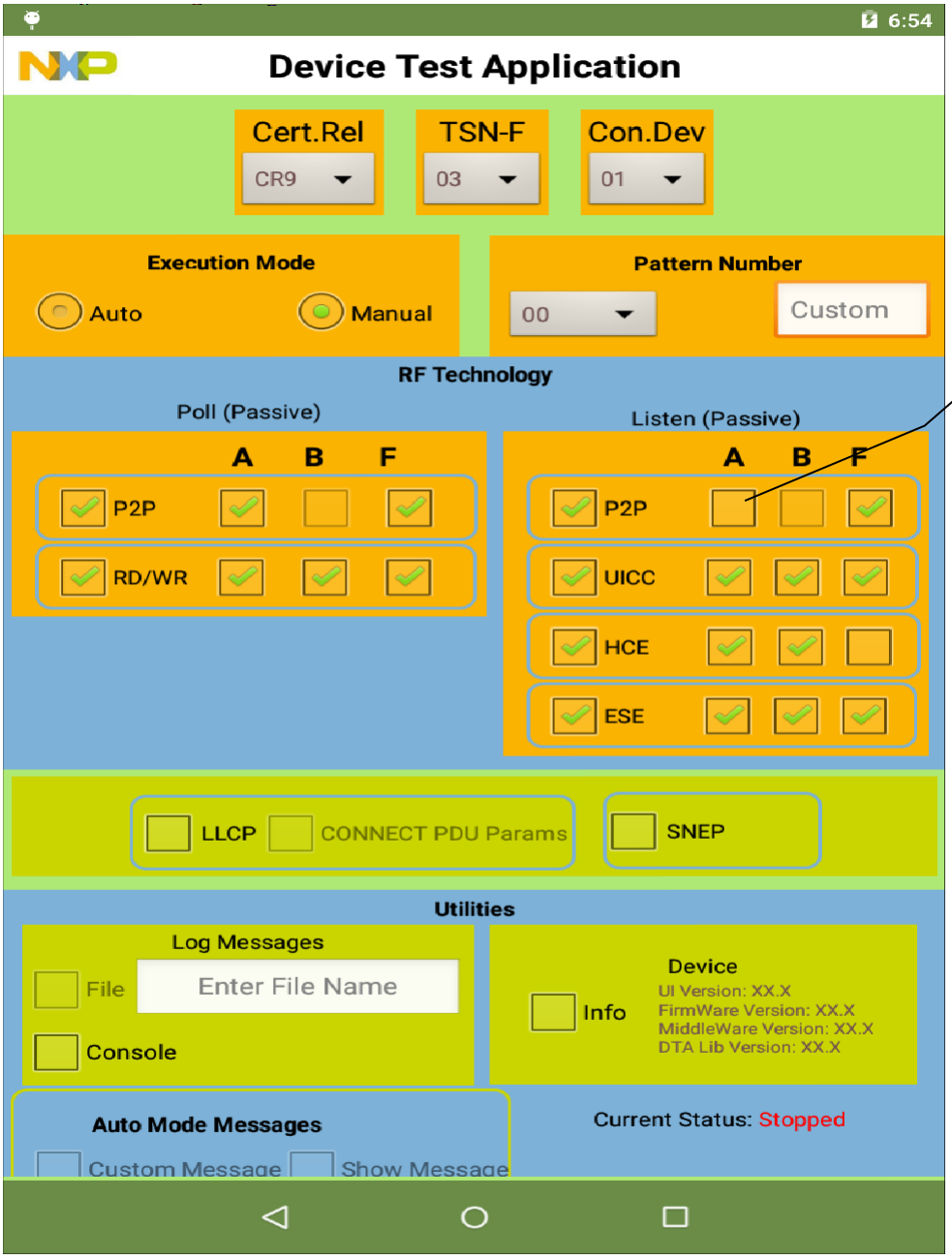
Card Emulation and UICC selection

Any one selection is possible simultaneously. Either LLCP or SNEP.

4.2.4 NXP_DTA_UI_SCR_SCENERIO_03: De-selections in Manual Mode

The application Current Status should be **Stopped** for de-selections. In the below screen the user has unchecked the 'A' RF Technology in P2P Listen mode. If all the technologies are unchecked in any mode, then the corresponding mode will automatically unchecked.

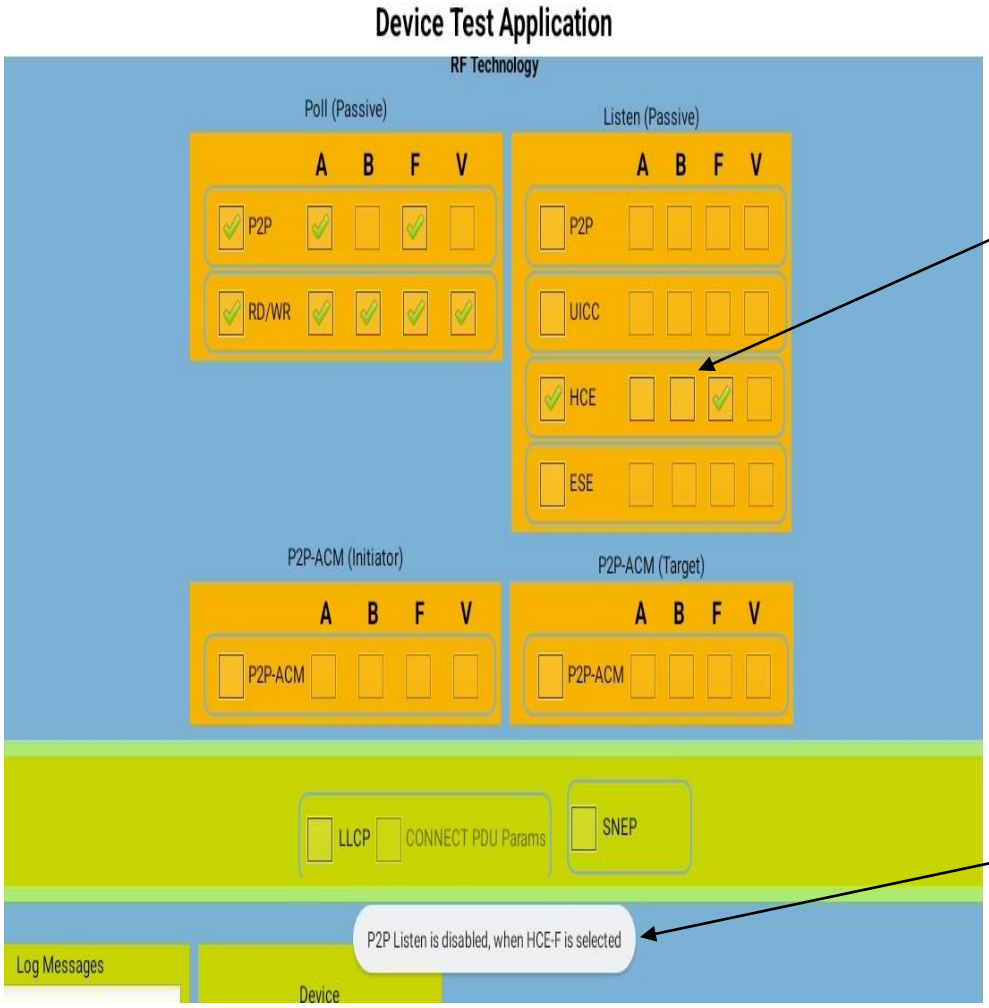
The Device Info check box is checked, which shows the device information, as soon as the Device Info check box is checked. If the user unchecks, then the info will not be shown.



Type A RF Technology is unchecked in P2P Listen mode

4.2.5 NXP_DTA_UI_SCR_SCENERIO_05: UI toast messages for HCE NFC-F:

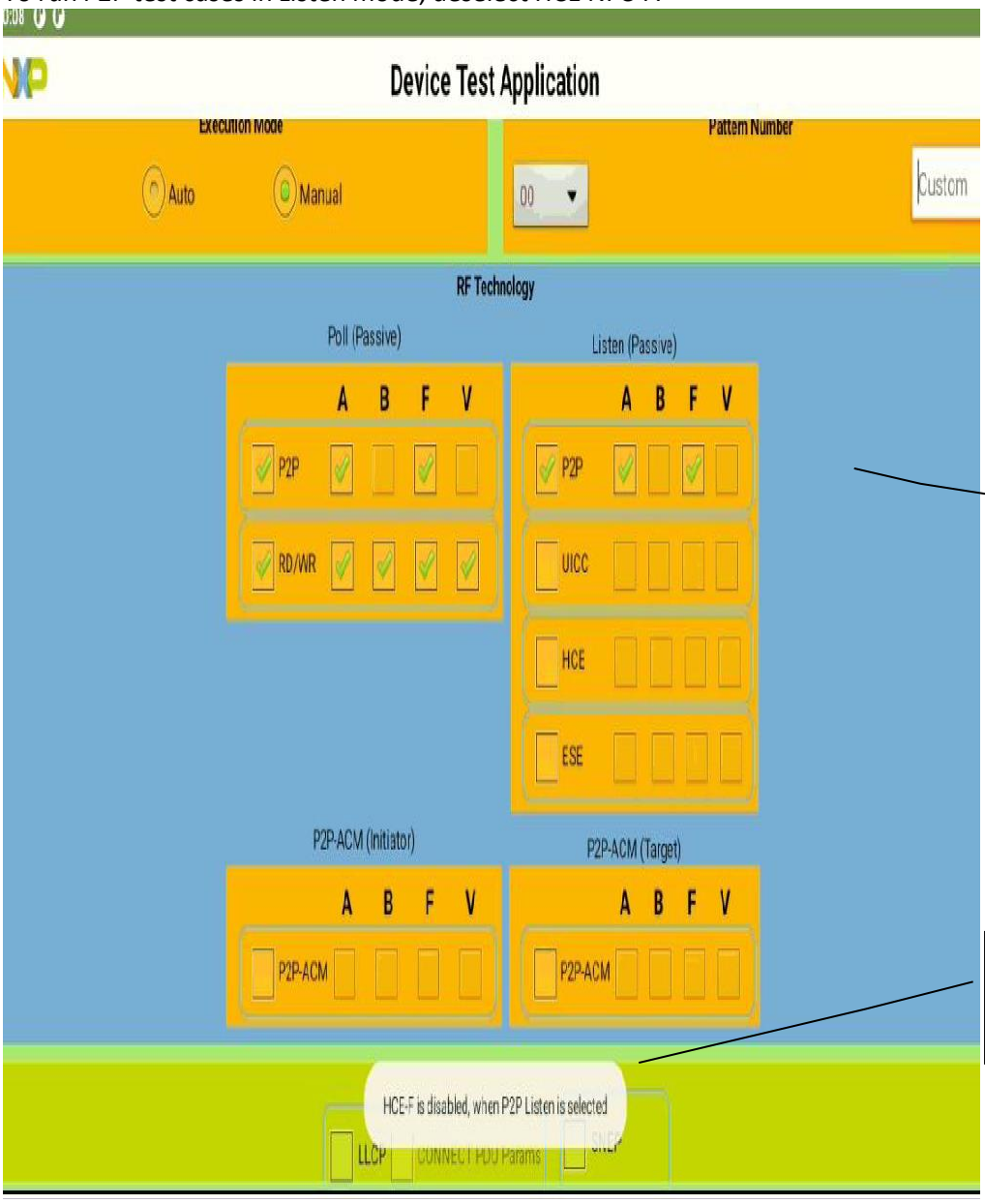
To run the Listen mode HCE NFC-F test case need to disable HCE NFC A & NFC B technology & enable HCE NFC F technology in Listen Mode.



HCE-A, B are disabled & HCE-F is enabled

Toast Message display HCE-A, B are disabled & HCE-F is enabled

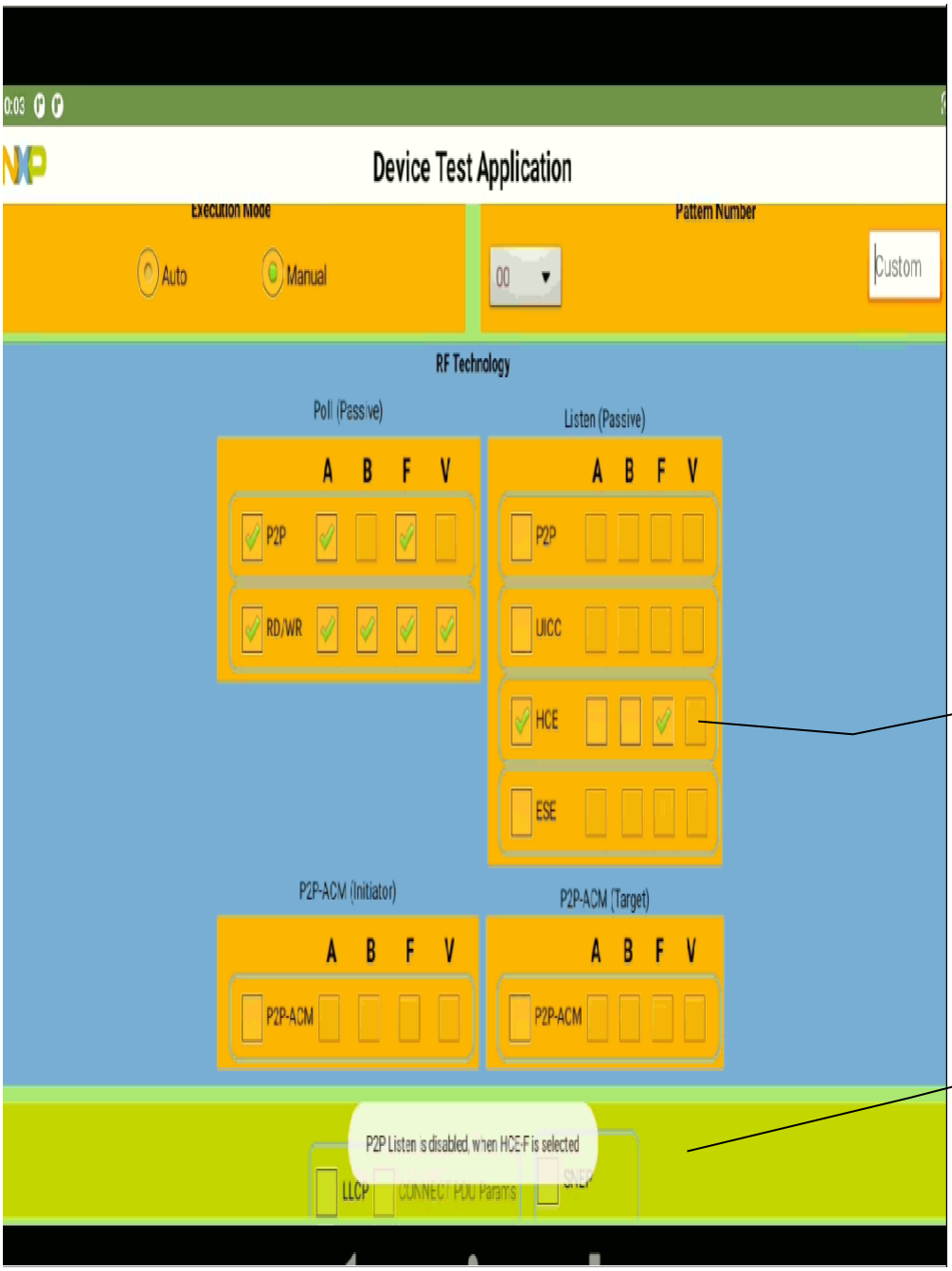
To run P2P test cases in Listen mode, deselect HCE NFC-F.



P2P Listen selected & HCE-F is disabled.

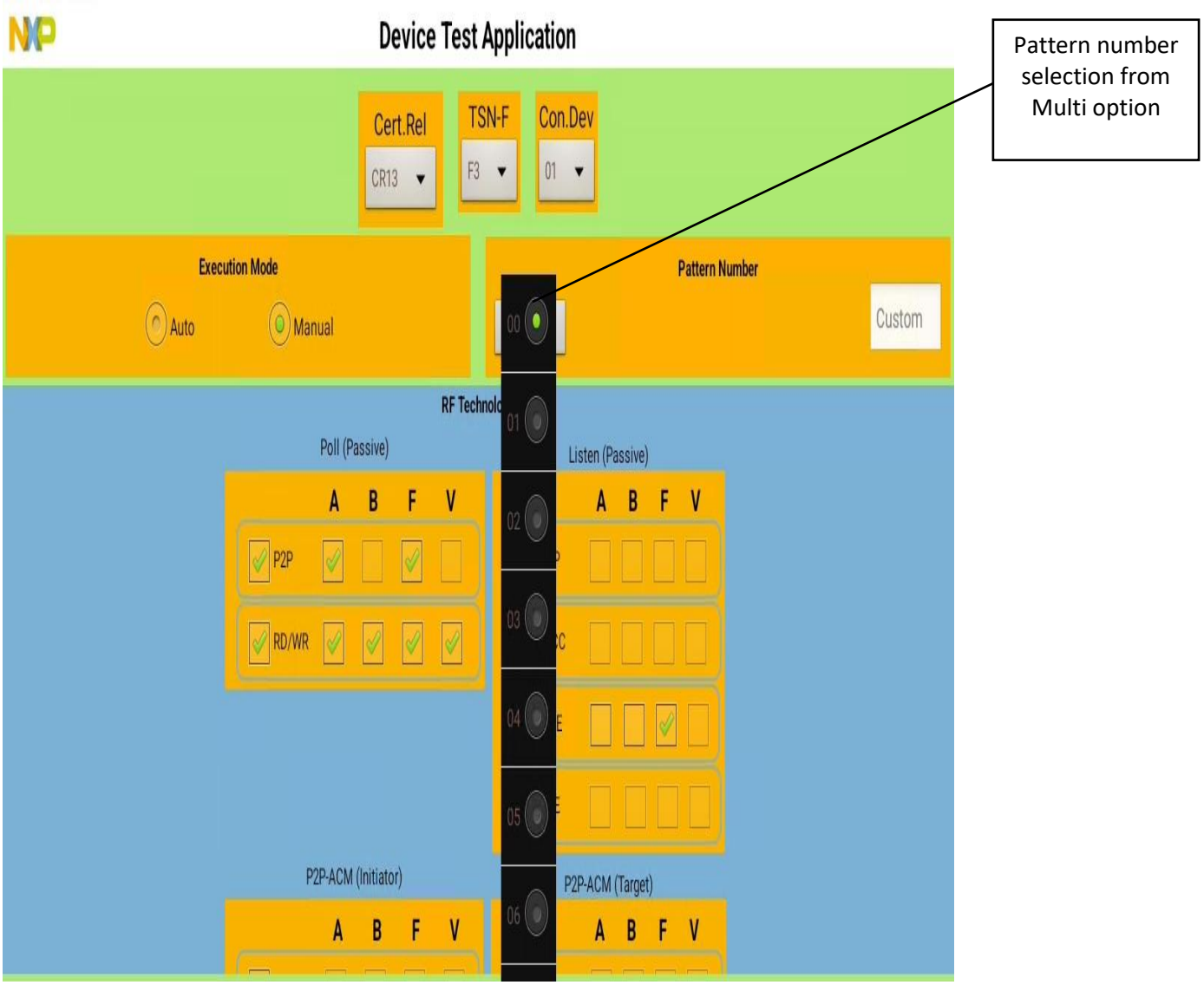
Toast Message display P2P Listen selected & HCE-F is disabled.

When HCE NFC-F technology enabled in DTA application, it will disable P2P A & F technology with Toast message.



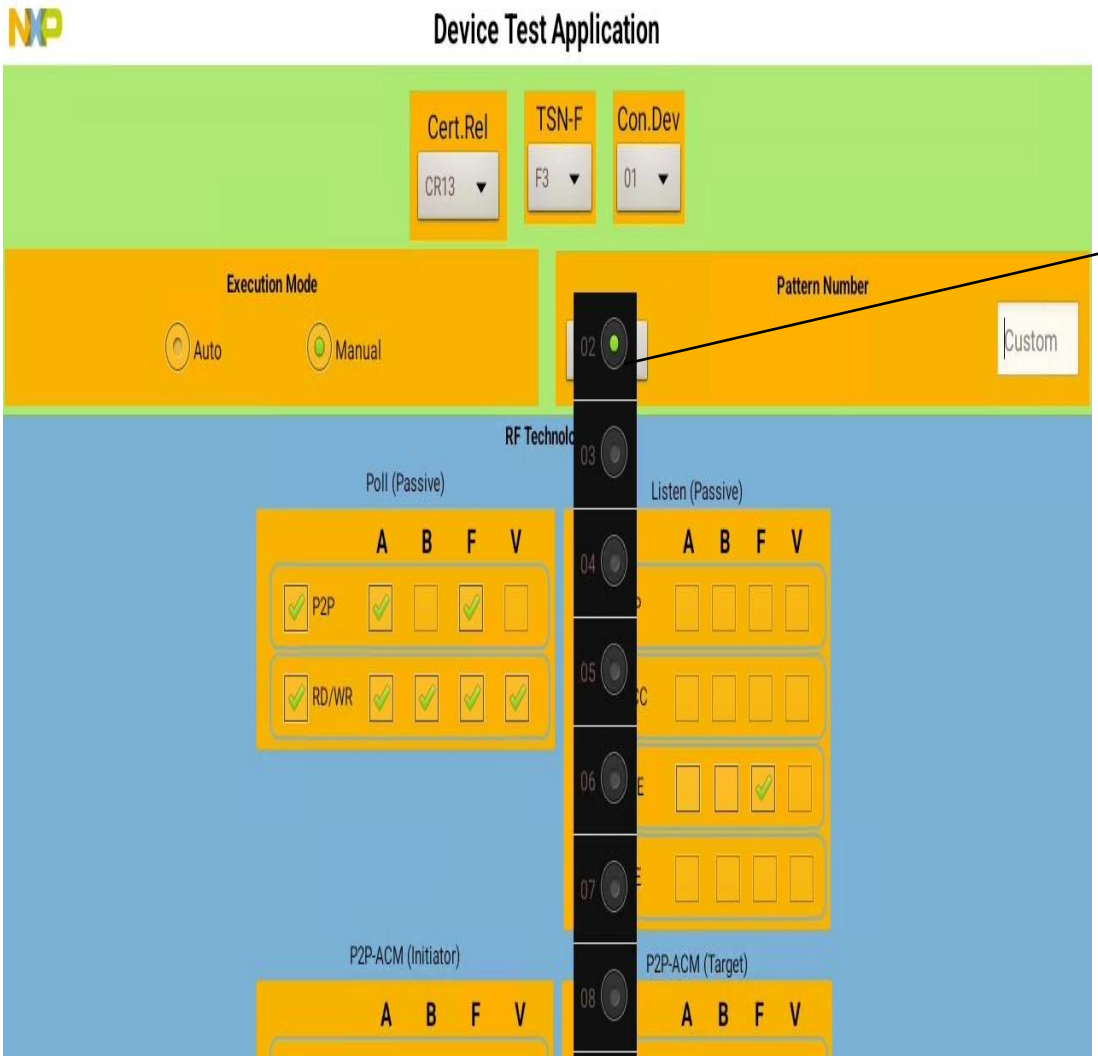
4.2.8 NXP_DTA_UI_SCR_SCENERIO_06: Multi Pattern Number Selection In Manual Mode

The user selecting the pattern number form Multi option drop down, see the Custom selection is cleared.



4.2.9 NXP_DTA_UI_SCR_SCENERIO_07: Different Multi Pattern Number Selection

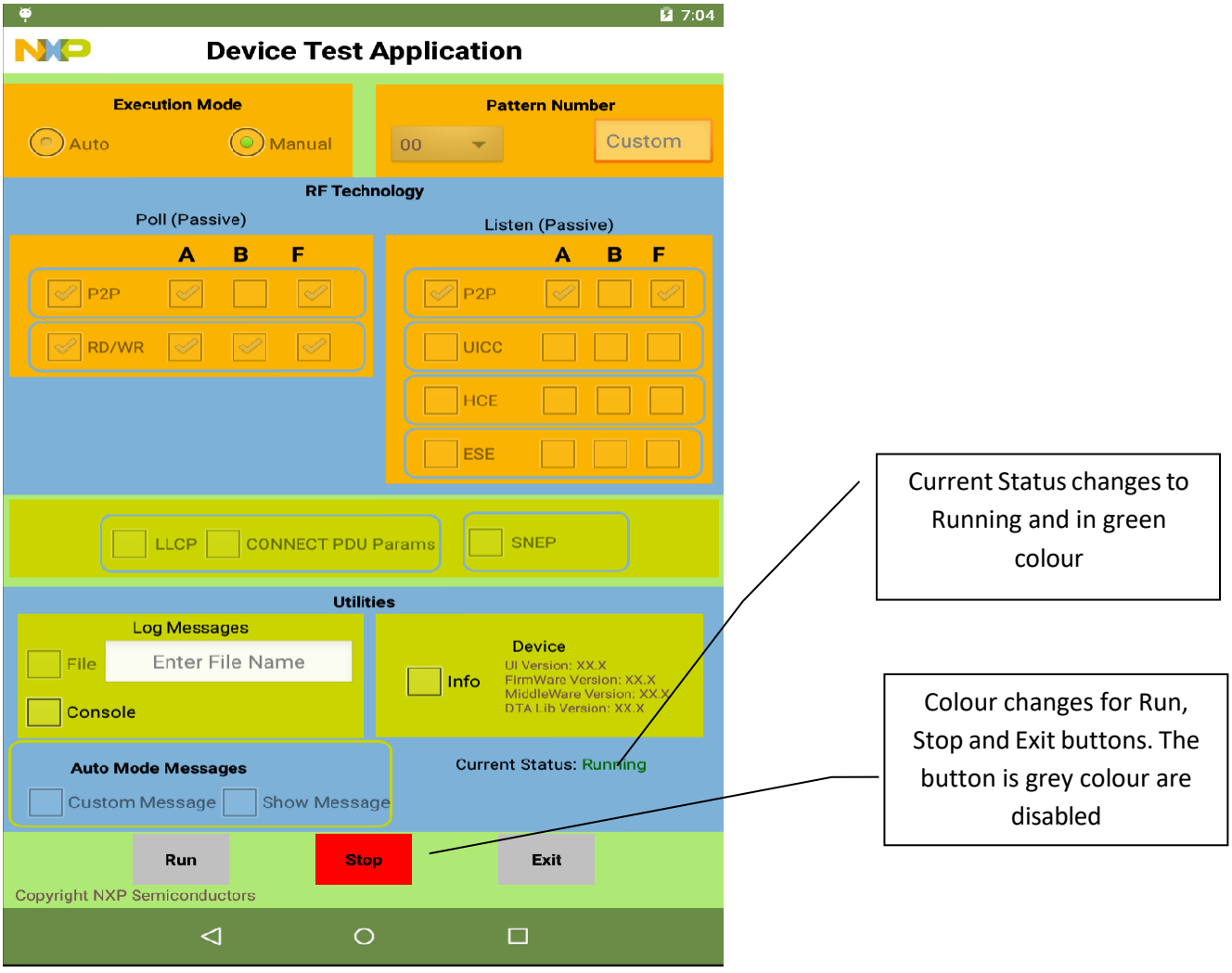
Different pattern number selection using Multi pattern number drop down when the application is stopped.



4.2.10 NXP_DTA_UI_SCR_SCENERIO_08: Running in Manual Mode

In this screen, the user press RUN button then the application will start running in manual mode. The current status will be changed to **Running** and the text color is in green. During running, no other selections are allowed.

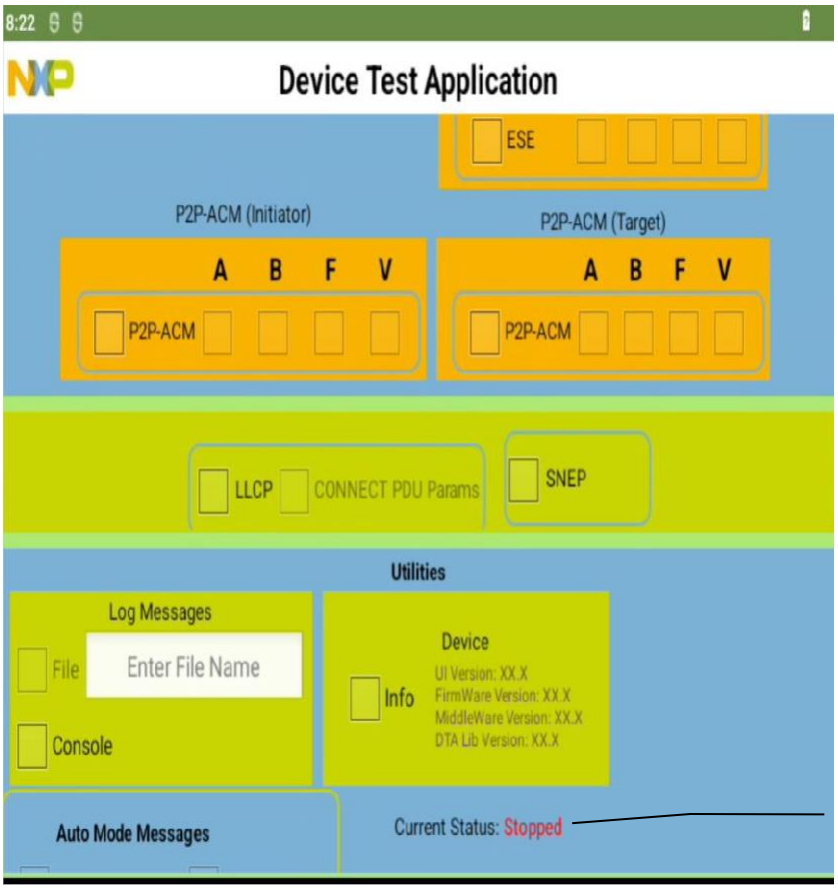
The RUN button will turn to GREY color. STOP to RED color & Enabled to use. EXIT to GREY color.



4.2.11 NXP_DTA_UI_SCR_SCENERIO_09: Stopping in Manual Mode

In the previous screen the user pressed Stop button to stop the application. Now the application has stopped as shown in the current screen. The current status is changed to Stopped and is in red color.

Now all the options are enabled for selection except the Custom Message and Show Message options in Manual mode.

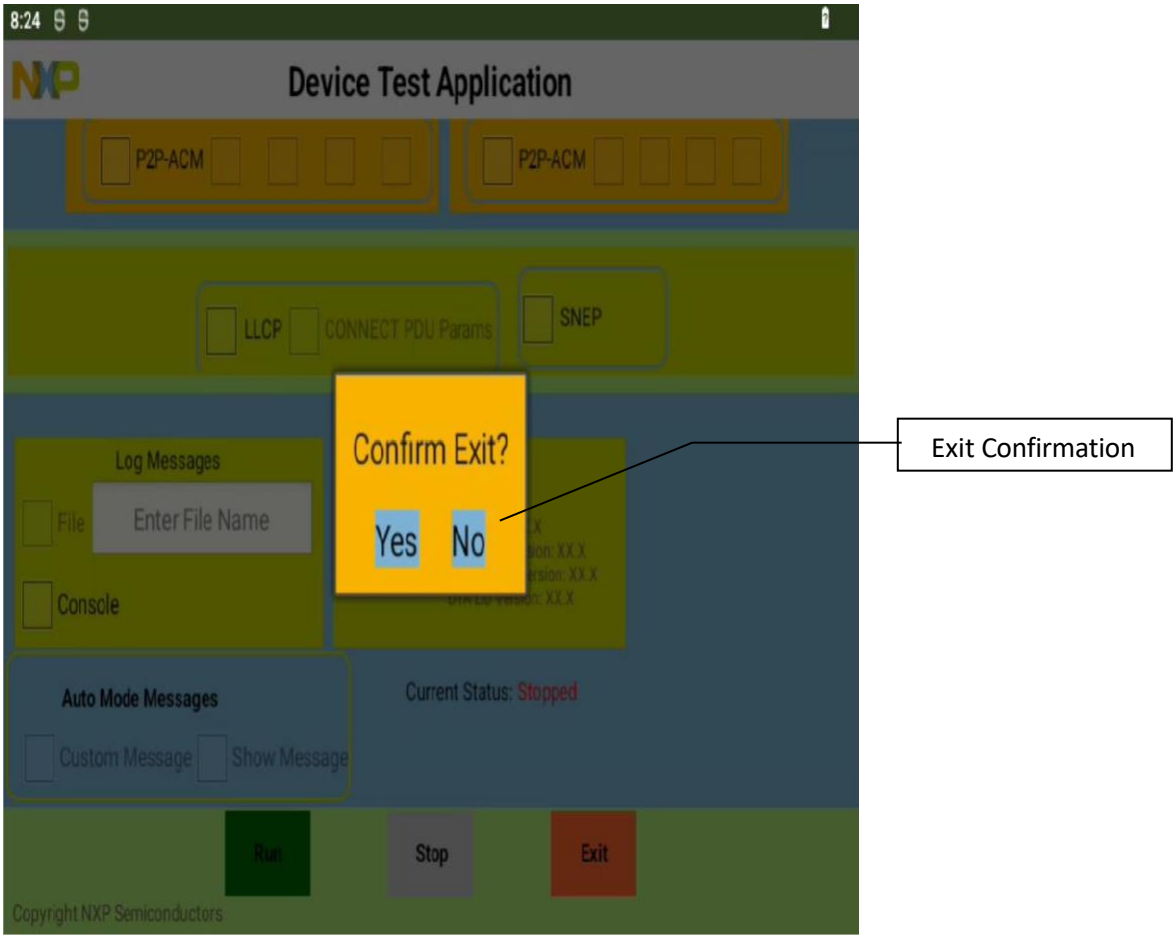


Current status changed to Stopped and the turned to RED colour

4.2.12 NXP_DTA_UI_SCR_SCENERIO_10: Application Exit

If the user press Exit button when the application is in Stopped state, then a pop-up alerts the user for Exit confirmation.

If YES then exits otherwise remains in default screen.



5. References

- None

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