



# NFC FORUM CR12.0: WHAT'S NEW?



# Summary

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The next specification of the NFC Forum Conformity Release 12.0 will introduce new test cases, especially for Poller/Reader analog testing (but not only). Here is the summary of the changes and the associated impacts.

## 1. Analog Test Plan

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### a. Analog Poller Test Plan

#### i. Enhancement of the Active Communication Mode (ACM) Technology Test

Active communication used in peer-to-peer mode (active P2P) requires validating that NFC devices are able to not enter in collision with another device that would like to talk. In CR11, a first test has been introduced (Threshold level test - TC\_AN20\_POL\_UND\_05), to verify the capacity of a device to listen that there is no device that are emitted a field.

With CR12, the ACM technology of a device will also be tested by checking:

- its field activation (TC\_AN21\_POL\_UND\_06) and de-activate (TC\_AN21\_POL\_UND\_07) to verify they are under a certain limit in order to ensure a correct detection by another device

#### ii. Introduction of NFC-V Technology

This NFC Forum technology, based on the ISO 15693 protocol, will be checked by new Poller analog test cases to validate:

- Sensibility (TC\_AN21\_POL\_NFCV\_02)
- Waveforms (TC\_AN21\_POL\_NFCV\_01)

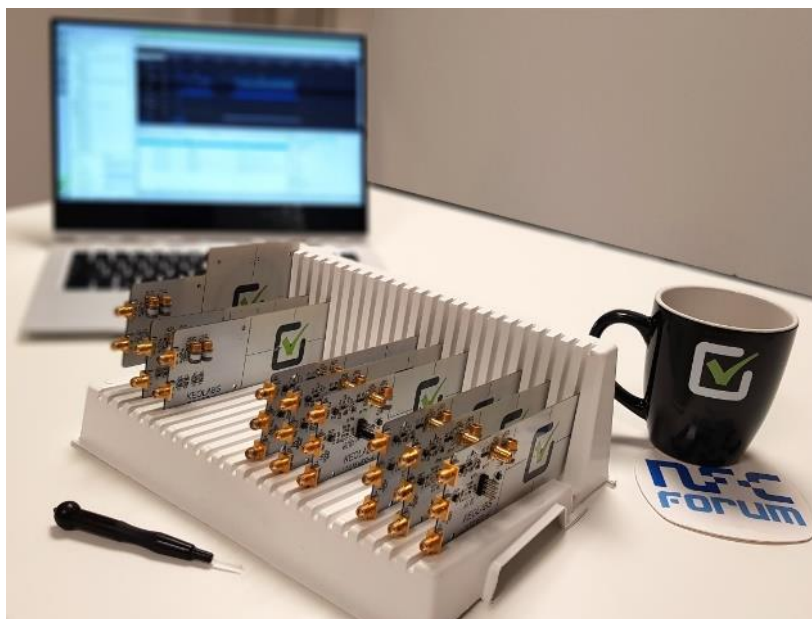


### iii. Waveform Measurements

Poller waveform measurements are quite difficult to perform due to some coupling effects with the Reference Listener. To make these measurements more accurate, NFC Forum CR12 has introduced a new probe for these measurements, the 8-shaped coil, to be less influenced by the Reference Listener while measuring the Poller waveforms.



Also for the waveform measurements, 3 new Reference Listener antennas have been introduced to be more aligned with ISO and EMVCO standards and to simulate more representative devices used on the market.



So the 3 existing Reference Listener antennas (Class 1, 3, and 6) tuned to 13.56MHz have been completed with 3 new Reference Listener antennas tuned to 16MHz and the 6 antennas are used in the following test cases:

- Modulation Poller to Listener - NFC-A - TC\_AN21\_POL\_NFCA\_01
- Modulation Poller to Listener - NFC-B - TC\_AN21\_POL\_NFCB\_01
- Modulation Poller to Listener - NFC-F - TC\_AN21\_POL\_NFCF\_01
- Modulation Poller to Listener - NFC-V - TC\_AN21\_POL\_NFCV\_01

## **b. Analog Listener Test Plan**

### **i. Excessive Field Exposure Test Case**

To be sure that a device exposed to an excessive field will continue to work properly, a new test case has been introduced based on ISO 14443 requirements, that stresses the device up to 12A/m (TC\_AN21\_LIS\_UND\_03). This works for passive tags, and for devices such as mobile phones to ensure they will not be disturbed by being in a strong field for tens of seconds.

### **ii. Impact of the 8-shaped Coil and New Reference Listener Antennas**

To test a Listener, the contactless tester (that is behaving as a signal generator / Poller) must be calibrated, especially its waveforms. To do so, the Reference Listener antennas are placed in front of the Reference Poller antennas.

Because of the 3 new Reference Listener antennas tuned to 16MHz and the 8-shaped coil used during waveform measurement, calibration of the tester has evolved. This will also impact the measures while testing a Listener (new test conditions, longer duration of the test).

One of the main objectives is to test cards/tags by simulating readers optimized for the cards/tags already present on the market



## 2. Digital Test Plan

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### a. Digital Poller and Listener Test Plan

#### i. Introduction of Active Communication Mode (ACM) Technology

Active communication used in peer-to-peer (active P2P) mode requires validating that NFC device are enable to not enter in collision with another device that would like to talk. It means:

- To validate the protocol implementation for Pollers (TC\_DP21\_POL\_NFCAF\_P2PACM) or Listeners (TC\_DP21\_LIS\_NFCAF\_P2PACM).

These new tests are applicable for Poller/Mobile devices using active P2P mode.

### b. Digital Poller Test Plan

#### i. Introduction to NFC-V Technology

This NFC Forum technology, based on the ISO 15693 protocol, will be checked by new digital test cases (TC\_DP21\_POL\_NFCV\_UND\_BV) to validate:

- Timing
- Anticollision
- Protocol implementation

It adds also some new tag 5 operation reader test cases.

#### ii. Tag Operation Validation

A new methodology has been introduced to better test Tag operation (Poller access) by implementing a real tag emulator in the Test tool that simulates a more realistic environment.

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