
NFC Validation Solution

Performing Debugging and Conformance Tests According to International Standards

Now that a wide range of devices—including mobile phones, speakers, wristbands, and home appliances—embed near-field communication (NFC) technology, the ever-growing list of NFC use cases includes:

- Contactless payment
- Ticketing
- Phone-to-phone communication
- Fast Bluetooth and wireless pairing

Contactless Test Station

Because each use case follows its own standard and interoperability testing method, NI offers the Contactless Test Station (CTS). This all-in-one NFC testing box can perform all normative test cases—defined by standardization organizations such as ISO, EMVCo, and the NFC Forum—without requiring additional hardware.



FIGURE 01. CONTACTLESS TEST STATION

The NI CTS provides several important benefits:

- Key NFC market coverage, including contactless payment, car sharing, and ticketing

- Conformance with international standards
- NFC Forum and EMVCo committee validation
- Proven deployment at more than 70% of relevant certification laboratories
- All necessary conformance testing components, including signal generator, oscilloscope, DAQ board, and RF amplifier
- ISO 10373-6, ISO 10373-7, NFC Forum, EMVCo analog, digital, and application testing libraries
- Fully automated operation, including DUT positioning and test report generation

Platform-Based NFC Validation Solutions

The CTS is an all-in-one test system containing all required hardware and software elements for performing analog and digital product NFC interface tests.

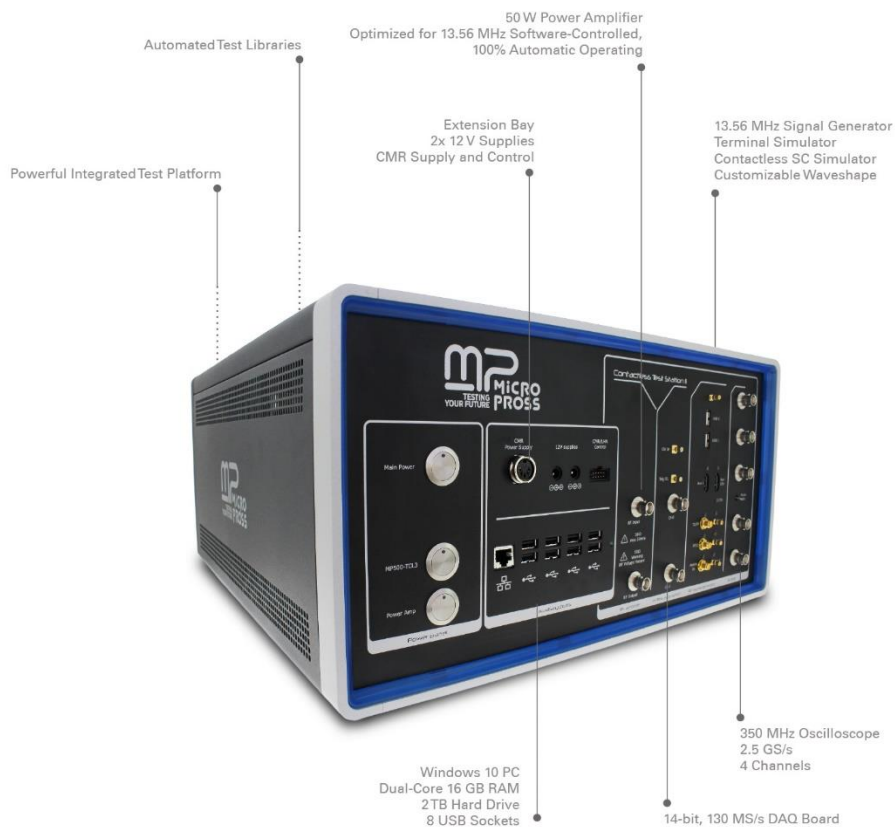


FIGURE 02.NI CTS

Technology Test Standards Support

The NI CTS supports the latest international standards relevant to NFC technology test.



ANALOG AND DIGITAL	ISO 10373-6	CEN/TS 16794	ISO 10373-7	NFC FORUM	EMVCO L1	QI
CTS	✓	✓	✓	✓	✓	✓
CTS ISO	✓	✓	✓			

FIGURE 03. INTERNATIONAL NFC TECHNOLOGY STANDARD

“DEKRA’s commitment with our customers is to offer always the best One Stop Service. For this, DEKRA has trusted the NI Contactless Test Station with integrated robot to successfully deploy our accredited laboratory for EMVCo contactless cards and mobile devices.”

-Noemi Pérez, Wireless Laboratory Manager, DEKRA

NFC Test Solutions Overview

Contactless Smartcard and Reader Validation



Contactless Smartcard and Reader Validation

The following standards define normal contactless smartcard and reader behavior, guaranteeing mutual interoperability:

ISO 10373-6 and ISO 10373-7 Test Solutions

- ISO 10373-6 Analog Proximity Integrated Circuit Card (PICC)
- ISO 10373-6 Digital PICC
- ISO 10373-6 Analog Proximity Coupling Device (PCD)
- ISO 10373-6 Digital PCD
- ISO 10373-7 Functional Vicinity Card

ISO 10373-7 Functional Vicinity Coupling Device and Tag Validation



Device and Tag Validation

These standards define NFC device and tag behavior on the analog, digital, and application layers, ensuring NFC device interoperability on those three layers:

NFC Forum

- NFC Forum Analog
- NFC Forum Digital
- NFC Forum Logical Link Control Protocol and Simple NDF Exchange Protocol
- NFC Forum Tag Performance
- NFC Forum Tag Application

Validating Public Transport Ticketing (European Standard)



Public Transport Ticketing Validation (Public Standard)

The following standards check smart ticketing interoperability for transportation:

CEN/TS 16794 Test Solutions

- CEN/TS 16794 Analog PICC
- CEN/TS 16794 Digital PICC
- CEN/TS 16794 Analog PCD
- CEN/TS 16794 Digital PCD

Contactless Payment System Validation



Contactless Payment System Validation

These standards check the interoperability between contactless cards, readers, and NFC devices in banking applications:

EMVCo L1 Test Solutions

- EMV L1 Contactless Card Analog
- EMV L1 Contactless Card Digital
- EMV L1 Contactless Terminal Analog
- EMV L1 Contactless Terminal Digital

Software Architecture

MPManager 3.0

All NI NFC devices come with the intuitive MPManager user interface, which provides access to all NFC tester functionalities. Use it to define test session conditions. By combining different actions, you can define your own custom scripts.

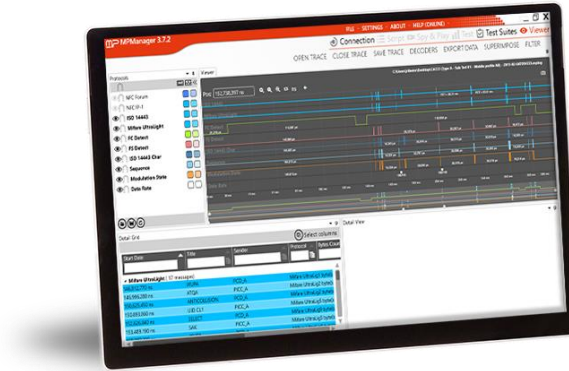


FIGURE 04. MPMANAGER USER INTERFACE

MPManager embeds a test platform so that you can run our automated test libraries. Tests include:

- Shmoo plot
- Timing measurement
- Protocol error injection (timing, parity, CRC)
- Resonance frequency/Q factor measurement

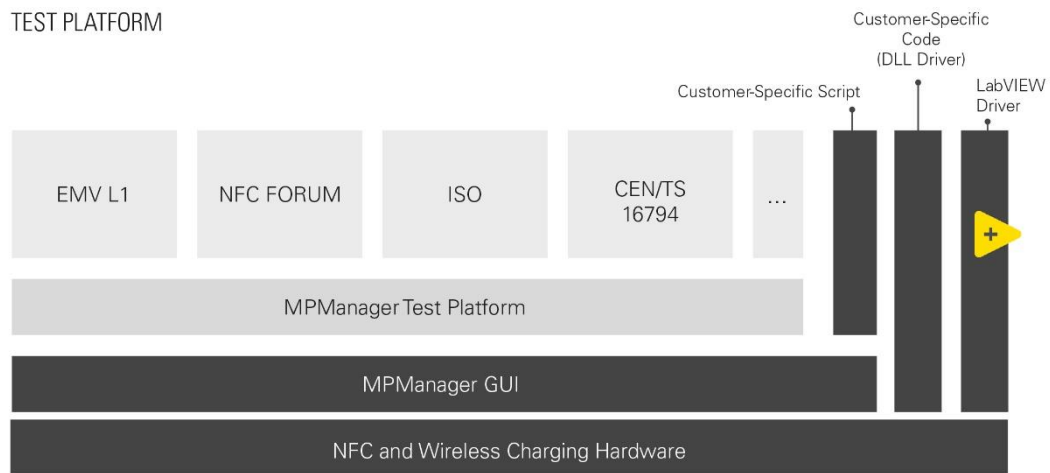


FIGURE 05. NFC TEST PLATFORM

Services and Support

NI has prioritized investment in support to give you an unmatched customer experience.

We know how important it is to have access to reactive expert support. To ensure that you can access it at any time, we rely on support engineers dispatched all over the world—in Asia, Europe, and the Americas. The NI service center located in Mainland China has extended its coverage to support a selection of NFC and wireless charging testers, providing peace of mind for customers in that region.

Training

Through our acquisition of Micropross, now National Instruments, we have garnered undisputed expertise on smartcard, RFID, and NFC industry technologies. Today, we offer access to this knowledge through training courses at the NI Lille office in France, as well as at the customer's location.

Training courses are taught by NI engineers who participate in standardization committees and, as such, are valuable spokespersons for anyone interested in understanding tips and tricks surrounding contact, contactless, and wireless charging technology.

Customize your training course based on knowledge level, time constraints, or particular topics of interest. During training, theoretical sessions are complemented with practical hands-on work.¹

Debug Sessions

Our debug sessions offer a complete range of test and precertification services—in both contact and contactless technologies—to help you solve any potential device-behavior issues.

Take advantage of debug and precertification sessions in several ways:

- Send us the sample, along with a list of tests to be performed. At the end of the test campaign, we send back a test report.
- Visit our laboratory in France with your device and conduct test sessions together with us. This particular approach works well when a problem needs a timely solution, because we can make iterative improvements and immediately check their impact.
- Work in autonomous mode with us, wherein we offer access to our different test and validation tools (protocol analyzers, compliance testers) and you operate them, consulting our specialists during the debugging process if/when necessary.¹

¹This service is subject to resource availability.

Maintenance Packages

We are committed to providing unrivaled service to our customers worldwide. We offer several maintenance packages, ranging from simple firmware (FW)/software (SW) updates or hardware (HW) repair, to on-site customer support or replacement tool supply—all at attractive prices, compared to purchasing individual services.

MAINTENANCE PACKAGES			
	Package 1 FW/SW	Package 2 FW/SW/HW	Gold Package FW/SW/HW
Online/Phone Helpdesk Access	√	√	√ With Priority Answer
Online FW/SW Update Access	√	√	√
Repair in Case of Hardware Failure	-	√	√
Dedicated Interlocuter to Assist with Logistics Tasks	-	-	√
Prioritized After-Sales Services	-	-	√
Replacement Tool Supply During Repair and Calibration	-	-	√
Change to Yearly Calibration (Upon Request)	-	-	√ Calibration Reports Available (Excluding ISO 17025 Service)
Free Accessory Exchange (Upon Receipt of Defective Unit, with Maximum of 1 Unit/Year)	-	-	√
Dedicated Phone Line and Dedicated Online Platform to Centralize Requests	-	-	√
All Logistics Costs Included	-	-	√

System Integration on Your Terms

NI offers a variety of solution integration options customized to your application-specific requirements. You can use your own internal integration teams for full system control or leverage the expertise of our worldwide network of NI Partners to obtain a turnkey system.

To learn how you can increase product quality and shorten test timelines, contact your account manager or NI NFC Group at mp-smartcards@ni.com.

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