MICROPROSS
A National Instruments Company

NFC)))

MANUFACTURING OPTIMISED TESTER FOR NFC AND QI ENABLED DEVICES

MP500 PT1-NFC

Micropross capitalized on its 15+ years of experience in the supply of test equipment for RFID, NFC devices, as well as wireless power transmitters and receivers to design the MP500 PT1-NFC.

The MP500 PT1-NFC is Micropross answer to manufacturers looking to perform highly qualitative tests on the NFC and Qi interface of their devices in a manufacturing environment.

Proposed with a set of antennas that are either used for conformance testing (EMVCo, NFC Forum, Qi) or with antennas that combine both PICC and PCD simulation modes, the MP500 PT1-NFC offers an unmatched level of customization

of the signal that is sent to the DUT (PCD field strength, amplitude of power transfert, ...).Plus, thanks to its highly qualitative embedded acquisition channel, it is able to perform physical measurement without any human intervention or external measurement device such as oscilloscopes or power amplifier.

Furthermore, the MP500 PT1-NFC is supplied with a set of automated test cases, allowing a hassle free deployment of the tool inside production factories, whereas its open API (C, C++, LabVIEW, ...) will allow an easy integration inside any proprietary test sequencer.

Business areas

| Telecom | Banking | E-health | M2M | WPC | E-Passport | E-ID (driver licences, ID cards...) | Wireless Chargers |

Testing modes

Contacted mode   Over the air mode

NFC FEATURES

NFC))

SIGNAL GENERATION FEATURES

The MP500 PT1-NFC is a highly customizable signal generator, covering all protocols used in the industry today.

Supported protocols include (in both reader/writer and card simulation) :
▸ ISO 14443 A/B
▸ ISO 15693
▸ FeliCa™
▸ Mifare™
▸ ISO 18092 passive and active modes

The user is able to define all waveshape characteristics, including :

Reader/writer simulation mode :
▸ Field strength
▸ Rise & fall time of the modulation
▸ Modulation index
▸ Pause time
▸ Bit duration

Card simulation mode :
▸ Load modulation amplitude
▸ Positive modulation
▸ Negative modulation
▸ Frame delay time

SIGNAL MEASUREMENT FEATURES

The MP500 PT1-NFC embeds a high performance acquisition channel. It is this way possible to perform a very deep inspection of the DUT, and therefore be 100% sure of its quality before shipping it to the end customer.

Measurements possible with the MP500 PT1-NFC include :
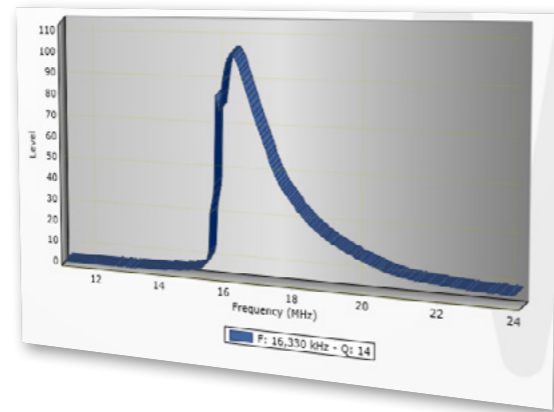
DUT Card mode characteristics :
▸ Load modulation amplitude
▸ Command processing time
▸ Payload data

DUT Reader/writer mode characteristics :
▸ Waveform characteristics (tr, tf, ovs, ...)
▸ Field strength
▸ Payload data

FREQUENCY RESPONSE CHARACTERISTICS

▸ Resonance frequency (variable power level)
▸ Q factor (variable power level)
▸ S11 parameter

QI FEATURES

SIGNAL GENERATION FEATURES

Coupled with Micropross TPT and TPR connection units, the MP500 PT1NFC can communicate with base stations and mobile devices that operate in the Power Class 0, handling both Baseline Power Profile (5W) and Extended Power Profile (15W) DUTs.
It is possible to define with a great level of accuracy the signal that is generated during the test procedure to challenge your DUT.

Example of adjustable parameters include :

Mobile device testing :
▸ clock frequency, duty cycle
▸ phase
▸ Inverter voltage (and power transmitted)
▸ FSK depth
Base station testing :
▸ load
▸ capacitances Cd and Cs
▸ ASK retromodulation depth

Naturally, the Qi communication protocol is supported, as well as out of standard variantes.

MEASUREMENT / TEST FEATURES

The MP500 PT1NFC offers numerous measurement options for base stations and mobile devices.
Those measurement features include :
Mobile device testing :
▸ load modulation measurement
▸ paquet sequence
▸ compare power received with power transmitted to check the FOD tuning
▸ ...
Base station testing
▸ Prx detection ability
▸ Guaranteed power test
▸ FSK modulation depth measurement
▸ Carrier frequency measurement
▸ Power mesurement
▸ ...

TECHNICAL SUPPORT

Micropross makes sure you are successful integrating the MP500 PT1-NFC inside your manufacturing test infrastructure.

Services such as **on demand software development, fixture design, consulting and technical support** are performed worldwide by our team of recognized experts.
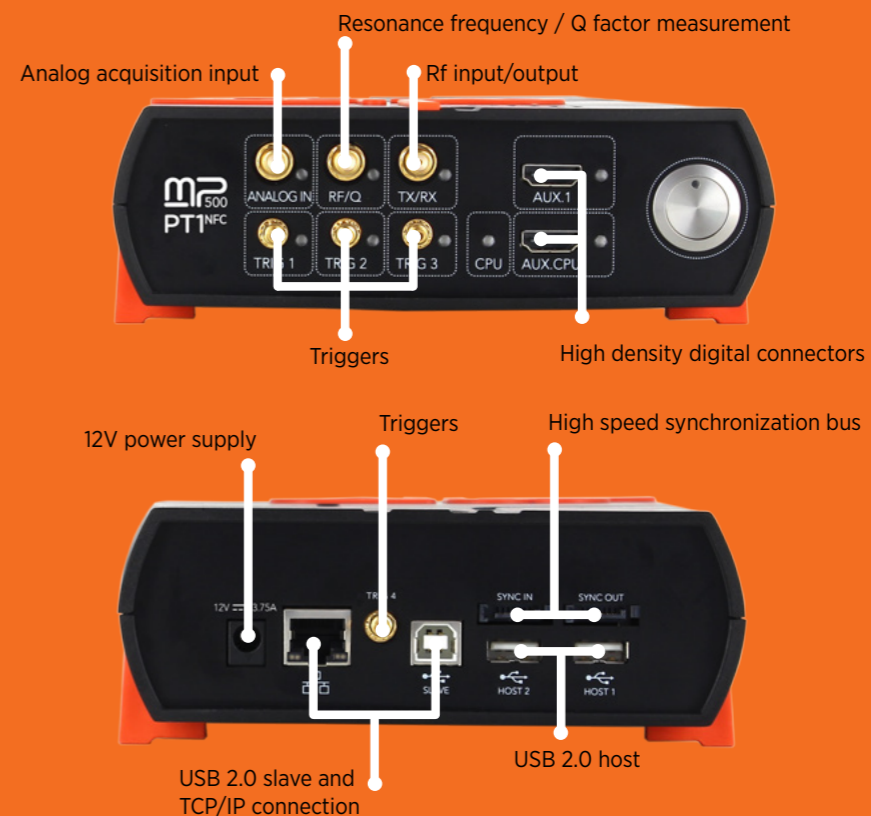
The MP500 PT1-NFC is a one **box only device**, connected to a test antenna. This test antenna is able to **stimulate the DUT**, and at the same time, the MP500 PT1-NFC is able to **monitor the transaction** thanks to its internal acquisition channel.
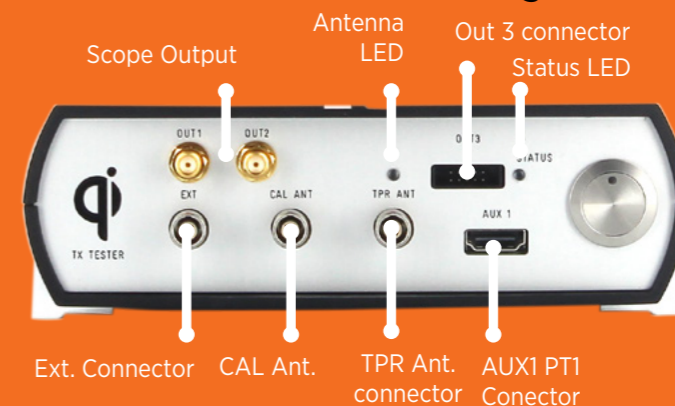
NFC testing configuration

PC

Qi testing configuration

PC

The MP500 PT1-NFC has the following connectivity :

Resonance frequency / Q factor measurement

Analog acquisition input

Rf input/output

ANALOG IN RF/Q TX/RX AUX.1
TRIG 1 TRIG 2 TRIG 3 CPU AUX.CPU

Triggers

High density digital connectors

12V power supply

Triggers

High speed synchronization bus

12V 3.75A   TRIG 4   SYNC IN   SYNC OUT

HOST 2   HOST 1

USB 2.0 slave and TCP/IP connection

USB 2.0 host

The TPR Connection Unit has the following connectivity :

Scope Output

Antenna LED

Out 3 connector

Status LED

OUT1 OUT2   OUT 3   STATUS
EXT   CAL ANT   TPR ANT   AUX 1

TX TESTER

Ext. Connector   CAL Ant.   TPR Ant. connector   AUX1 PT1 Conector

The TPT Connection Unit has the following connectivity :

Antenna LED

Analogic demodulators output

Scope Output

Out 3 connector

Status LED

OUT1 OUT2 V Q MOD I DEMOD OUT3   STATUS
LCR METER   TPT ANT   CAL ANT   AUX 1

RX TESTER

LCR Meter   TPT Ant. connector   CAL Ant.   AUX1 PT1 Conector

ANTENNA OPTIONS
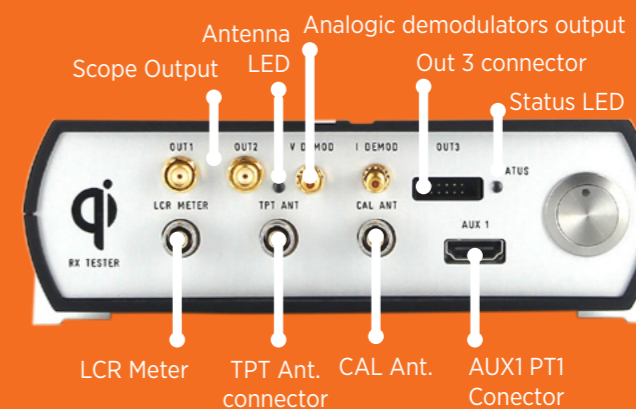
Depending on their testing needs, customers may using one of the normative antenna defined by EMVCo, the NFC Forum, or the Qi test specification. In order to handle with the best convenience possible NFC devices that can act in both reader/writer and card modes, Micropross has designed innovative triple antennas, making it possible to test all NFC modes without having to change the test antenna.

NFC testing

Available normative antennas:
▸ NFC Forum Poller 0, 3, 6
▸ NFC Forum Listener 1, 3, 6
▸ EMVCo reference PCD
▸ EMVCo reference PICC
▸ ISO 10373-6:2016 reference PICC (1, 2, 3, 4, 5, 6)
▸ ISO 10373-6 calibration coil 1, 2
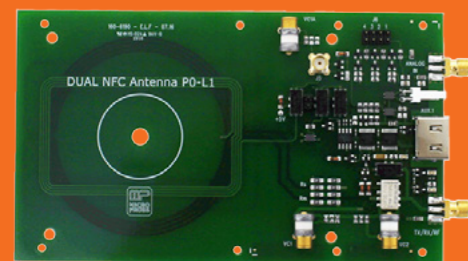
Available triple antennas:
▸ NFC Forum Poller 0 + Listener 1 + calibration coil
▸ NFC Forum Poller 3 + Listener 3 + calibration coil
▸ NFC Forum Poller 6 + Listener 6 + calibration coil
▸ EMVCo reference PCD + reference PCD + calibration coil
▸ EMVCo reference PCD + reference PCD + calibration coil (optimised for wearables)

Qi testing

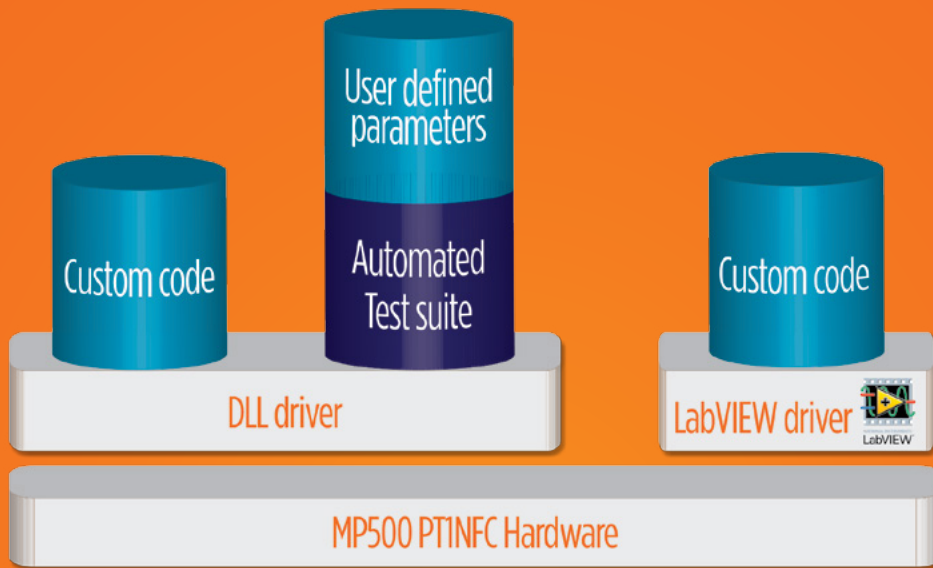
Available antennas for mobile device testing :
▸ TPT 2/MP1

Available antennas for base station testing :
▸ TPR #1A, 1B, 1C, 1D, 1E, 3, 4, 5, 6
▸ MP1A, MP1B, MP1C, MP3

SOFTWARE INTEGRATION

There are plenty of ways to integrate the MP500 PT1-NFC inside your test infrastructure.
Micropross provides drivers in the form of a **DLL, a LabVIEW driver, or even a fully automated test suite.**

In order to assist the user in the design phase of its manufacturing infrastructure, Micropross provides software tools, such as the **analog waveform viewer**, or the globally adopted **MPManager software.**
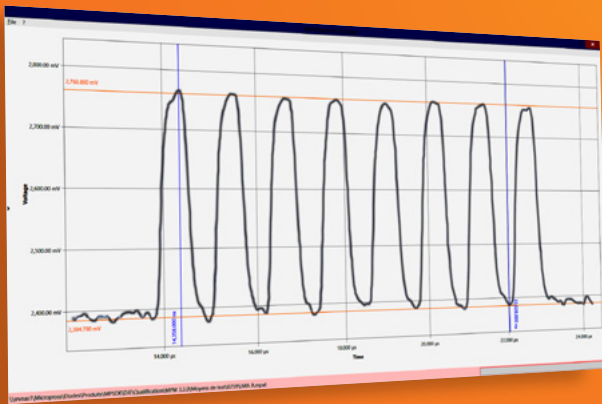
The **MPWaveshape viewer** is a tool that is used to view the data coming from the embedded acquisition. Measurement cursors are positionned automatically, allowing the user to identify right away how the measurement are performed.
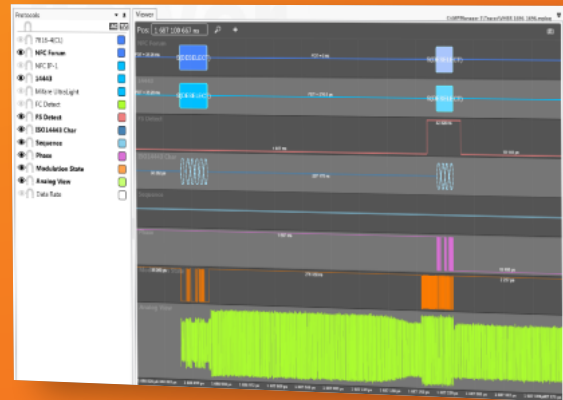
MPManager is a **GUI** that is acclaimed by the industry, because of its unique ability to reconcile convenience of use with flexibility. In particular, the MPManager Viewer allows the user to perform protocol inspection, as well as measure all kinds of timings.

ASSOCIATED OPTIONS

▸ Contactless smartcard simulation option
▸ Development assistance resources (MPManager, Viewing tools (analog & digital), ...)
▸ Automated test suite