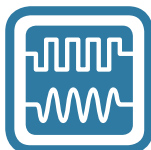




# KEG LABS

your challenges, our solutions



EXPLORE



VALIDATE



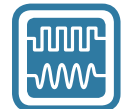
CERTIFY



# KEOLABS

Explore, Validate and Certify Smart Objects

KEOLABS' end-to-end testing tool and service offer enables validation of smart objects and NFC systems used in identity, payment and other applications. KEOLABS accompanies customers through their complete design cycle from product conception to final conformance testing.



**TESTING PLATFORMS**  
EXPLORE, PROTOTYPE AND CHARACTERIZE



**VALIDATION SOLUTIONS**  
IN-HOUSE CONFORMANCE VERIFICATION

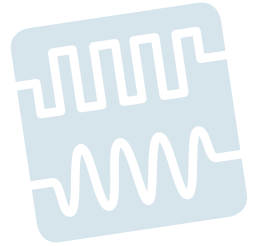


**TESTING LABORATORY**  
INDEPENDENT CONFORMANCE CERTIFICATION



# 1

## TESTING PLATFORMS



### EXPLORE TECHNOLOGIES, VALIDATE DESIGN CHOICES

*In the quest to improve product performance and reliability, having the right testing tools is essential to understanding and optimizing technology.*

**KEOLABS' Quest line** of testing tools challenge technology and provide insights into performance in order to help users clearly understand and overcome problems with ease and efficiency.

### MASTER STATE OF THE ART INSTRUMENTATION IN A SINGLE CLICK



**KEOLABS' Quest line** of testing tools delivers state of the art characterization capabilities with unprecedented ease-of-use through the new Quest software environment.

Quest provides **characterization** tests as **preconfigured scenarios**. These scenarios control the tester's programmable features to enable single-click access to contact or contactless test such as waveform analysis and performance profiling.

The scenario's configuration, description, scripts, traces and results are all stored in a workbook file that can be easily shared with others using the free Quest software.

## CONTACTLESS TESTER

**ProxiLAB** provides fully **configurable reader** and **card signal emulation** for all 13.56 MHz protocols (NFC, ISO/IEC 14443, FeliCa, ISO/IEC 15693) for cards, and NFC devices. It supports **VHBR** at all bit rate (up to 6.8Mbps in ASK and up to 27Mbps in PSK). Natively it comes with a **Vectorial Network Analyzer** (0-60MHz). It offers **total, precise control** of analog and digital signal parameters, and the **freedom** to buy only the functionality users require.

**Ideal tool for...**

- Prototyping, characterization.
- Standard-specific validation.



## CONTACTLESS SPY

**ProxiSPY** provides **easy-to-use spy and analysis** for analog, digital and application levels. It covers the full range of 13.56 MHz contactless protocols (NFC, ISO/IEC 14443, FeliCa, ISO/IEC 15693). Probes are optimized for **reliable, robust capture and ease-of-use**. It integrates with ContactLAB for full visibility of contact and contactless interfaces in NFC systems.

**Ideal tool for...**

- Exploring contactless technologies.
- Interoperability troubleshooting.



## CONTACT SPY & TESTER

**ContactLAB** all-in-one platform provides **fully configurable signal emulation, spy, and analysis** covering protocols ISO/IEC 7816, I2C, SPI and SWP (HCI/SHDLC) for validating contact smart cards, USIM and contactless front end in mobile phones. It offers **total, precise control** of signal parameters, and the **freedom** to buy only the functionality users require. It integrates with ProxiSPY for full visibility of contactless and contact interfaces in NFC systems.

**Ideal tool for...**

- Prototyping, characterization.
- Standard-specific validation.
- Interoperability troubleshooting.



## AUTONOMOUS SPY & TESTER

**NomadLAB** provides **autonomous** communication spy and signal emulator with **tactile interface** and **power from battery** or USB. It is equally adapted to application testing in a lab or field environment, providing communication spy and analysis for NFC, ISO/IEC 14443 A/B card signals, FeliCa, ISO/IEC 7816 and SWP (HCI/SHDLC) and emulation of ISO/IEC 7816 and ISO/IEC 14443 card signals for active testing of card readers.

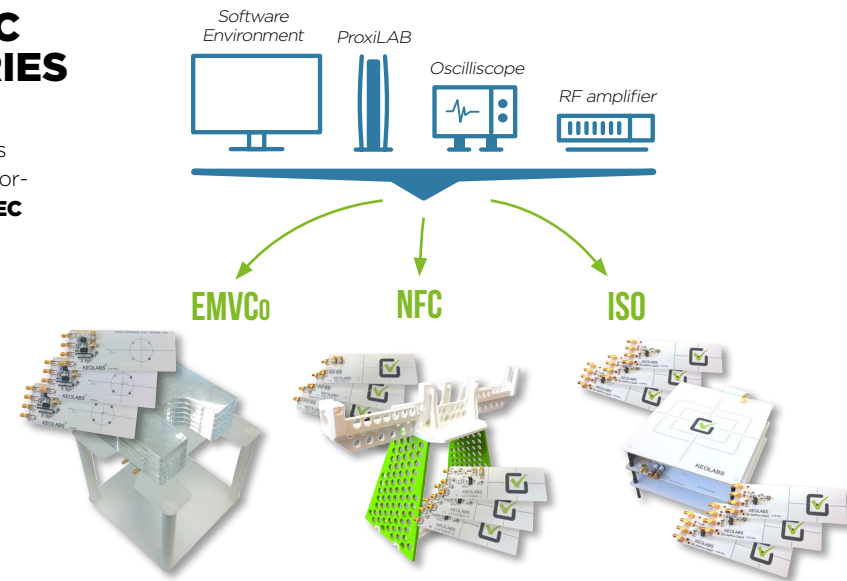
**Ideal tool for...**

- Interoperability troubleshooting in lab or field.
- Application-level validation of contact and contactless readers.



## STANDARD-SPECIFIC TESTING ACCESSORIES

KEOLABS provides all the hardware and accessories required to build test benches dedicated to in-house verification of conformance to **EMVCo**, **NFC Forum** and **ISO/IEC 14443** standards.



## TEST AUTOMATION

**KEOLABS Robx** turn-key, 3, 5 or 6-axis test bench automation systems improve testing control and repeatability of results any time that physical handling of the tested device is required.

Robx is a complete lab-ready installation designed for safe, easy test bench integration, configuration and operation. Accessories are available for automating batch testing of cards and mobile phones, and for verifying ISO/IEC 14443, NFC Forum and EMVCo standards conformance.



# 2

## VALIDATION SOLUTIONS

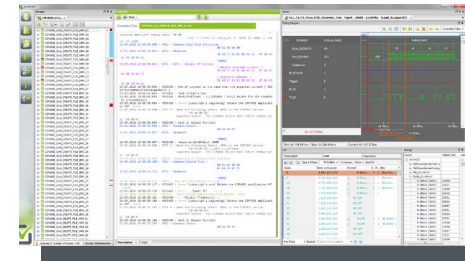


### STANDARD-SPECIFIC TESTING SOLUTIONS FOR SMART CARDS, READERS & NFC

Validation solutions allow in-house verification of device compliance to functional and application-specific standards. KEOLABS participates in standardization organizations, contributing to evolutions in testing standards and to ensure solution compliance to changes in technologies and standards. Validation solutions are verified and used in KEOLABS' Testing Laboratory where they must meet the constraints of standards conformance and reliability.



## SCRIPTIS™ TEST ENVIRONMENT



This standard, open and flexible testing environment manages all KEOLABS' standard-specific validation solutions. It provides test **management, reporting, editing** and **debugging** features, as well as precise **visualization** of card/reader signals associated with a specific test result.

**KEOLABS'** testing scripts are based on the open Python programming language. Users can easily copy and modify the scripts to create their own test cases.

- **Single interface for test bench integration.**
- **Easy, push-button campaign management, results viewer.**
- **Full visibility of test results including DUT/test bench signals.**
- **Open environment for modifying test cases.**
- **Includes script debugger.**
- **Personalized report generation.**



## NFC VALIDATION SOLUTIONS

KEOLABS provides off-the-shelf solutions to verify conformity of NFC enabled objects and systems to relevant standards including **NFC Forum, GCF, ISO/IEC 14443** and **ISO/IEC 18092** for CLF and UICC interfaces. The testing environment meets strict conformance requirements to NFC Forum standards for verifying analog, digital and application implementations in passive devices (cards, tags, mobiles, etc.) and active systems (readers, mobiles). It is complemented by **ETSI** and **Global Platform** conform solutions for contact interfaces (HCI, SHDLC), enabling concurrent testing of contact and contactless interfaces for comprehensive validation of NFC mobile phones.



## PAYMENT VALIDATION SOLUTIONS

For international payment cards, mobiles and readers, KEOLABS provides off-the-shelf solutions to verify conformity to relevant **EMVCo** standard. KEOLABS' turnkey EMVCo test bench is available where required for Level 1 verification.



## IDENTITY VALIDATION SOLUTIONS

KEOLABS provides off-the-shelf solutions to verify conformity of international electronic passport (eMRTD) to relevant standards including **ICAO Doc 9303** and **BSI TR-03110**. KEOLABS also provides solutions for ID card and driving licence applications compliant respectively with **eIDAS** and **ISO/IEC 18013**.



## TRANSPORT VALIDATION SOLUTIONS

For cards and readers used in fare collection applications, KEOLABS provides off-the-shelf solutions to verify conformity to relevant **CIPURSE** standard. KEOLABS' CIPURSE application-level testing solution meets strict conformance to the OSPT Alliance standards and is the alliance's official tool for conformance verification. **CEN/TS 16794** compliant test bench is also available for object testing at analog and digital levels.



	VALIDATION LEVELS	OBJECT TYPES	AUTOMATION
<b>NFC Forum, GCF, SNEP/LLC</b>	Analog, protocol, application	Mobile, Tag	✓
<b>ETSI-HCI/SHDLC</b>	Electrical, digital	CLF, UICC	
<b>EMVCo</b>	Level 1	PICC, Mobile, PCD	✓
<b>ICAO, BAC, PACE, EAC</b>	Analog, digital, application	PICC, PCD	✓
<b>ISO/IEC 18013</b>	Analog, digital, application	PICC, PCD	
<b>eIDAS</b>	Analog, digital, application	PICC	
<b>ISO/IEC 14443</b>	Analog, digital	PICC, PCD	✓
<b>CEN/TS 16794</b>	Analog, digital	PICC, PCD	✓
<b>CIPURSE</b>	Application	PICC, Mobile	

PICC, Proximity Integrated Circuit Card = contactless smart card.  
 PCD, Proximity Coupling Device = contactless reader.  
 CLF, Contactless Front End.  
 UICC, Universal Integrated Circuit Card.



# 3

# TESTING LABORATORY

## INDEPENDANT, ACCREDITED CONFORMANCE TESTING

KEOLABS' Testing Laboratory accompanies customers through system validation with **ISO/IEC 17025 accredited** services. It provides both **functional electrical** and **physical testing** to fully assess a device's operational reliability. Its testing capabilities include:

- **Physical durability (climate, bending, abrasion, impact, x-ray, chemical, etc.).**
- **Analog, electrical and EMD characteristics & performance.**
- **Digital protocol implementation.**
- **Application level implementation.**

The laboratory is a recognized testing center for smart cards and card readers, and maintains an accreditation from the Cofrac (French Accreditation Committee) under the standard **ISO/IEC 17025** (Accreditation n°1-2468, a list of locations and scopes are available on [www.cofrac.com](http://www.cofrac.com)).

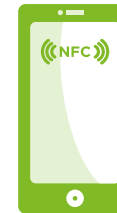
KEOLABS participates in **all major certification processes** for secure transaction, identity and transport sectors, contributing to the evolution of test standards, methods and tools.

**Debug sessions** allow customers to conduct testing before engaging in independent validation of conformity. Sessions are conducted in accordance with the customer's needs and may be based on a full test standard (pre-certification), part of a standard or a proprietary test plan associated with a specific issue.

Conformance testing is conducted in strict adherence with a standard test specification. This independent conformity testing is conducted in a 'single shot' mode where samples are pre-identified and tests are performed once. The customer is not present during testing.



Accreditation  
n°1-2468  
Scope available  
on [www.cofrac.fr](http://www.cofrac.fr)



	TESTING TYPE	OBJECT TYPES
<b>ISO/IEC 10373-1</b> <b>ISO/IEC 10373-3</b> <b>ISO/IEC 10373-6</b>	Durability, analog, protocol/digital	ICC, PICC, PCD
<b>ICAO, BAC, PACE, EAC</b> <b>ISO/IEC 18745-1</b> <b>ISO/IEC 18745-2</b>	Durability, analog, protocol/digital, application	PICC, PCD
<b>BSI TR03105</b>	Analog, protocol/digital, application	PICC
<b>ISO/IEC 24789</b>	Durability	ICC, PICC
<b>ISO/IEC 18013-4</b>	Application	ICC, PICC
<b>CEN/TS 16794</b>	Analog, protocol/digital	PICC, PCD
<b>CIPURSE</b>	Application	PICC, Mobile
<b>NFC Forum</b>	Analog, protocol/digital, application	PICC, PCD, Mobile
<b>EMVCo</b>	Analog, protocol/digital	PICC, PCD



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# KEGLABS

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