

## Spectro 2

Universal Tester for Smart Card Development



Spectro 2 is designed for the development and test of contact-based smart cards and chips. The particular strength of this pre conformance all-rounder is that it covers all card interfaces: ISO/IEC 7816, SWP/HCI, and IC-USB. For test requirements that go beyond the scenarios covered by the supplied COMPRION test benches, Spectro 2 comes with a Contact Card Testing API. Spectro 2 is the non-calibrated and cost-effective alternative test tool for our GlobalPlatform-validated conformance platform Spectro TP as it runs the same test cases.

The integrated digital storage oscilloscope allows comprehensive signal analysis on electrical level. COMPRION's Connectivity Test Center is the user-friendly software that provides comprehensive access to all functionalities of Spectro 2.

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With the optionally available Interoperability Test Center, Spectro 2 can be used as a spy tool that traces and analyzes the complete communication between smart cards and terminals.

### Main Capabilities

- Digital simulation of the UICC terminal interface: ISO 7816, SWP/HCI, IC-USB
- Test benches for ISO/IEC 7816, SWP, HCI, Global-Platform; and Java API
- Contact Card Testing API for programming of individual test scenarios
- Synchronous ISO, SWP/HCI, IC-USB monitoring
- Support of synchronous NFC monitoring with CLT Move, COMPRION's contactless tracer
- Powerful analyzers for timing measurements and error identification
- Integrated oscilloscope

### Use Cases

- Development of smart cards/chips
- SWP/HCI pre conformance testing (digital & analog) according to ETSI
- Smart card protocol implementation
- Interoperability testing

# Specification

## FEATURES

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### ISO/IEC 7816 Interface Testing

- Terminal simulation according to ISO/IEC 7816
- Supported ISO/IEC 7816 protocols: T=0 and T=1
- Adjustable logical protocol parameters
- Simulation VCC signal:
  - Voltage range: 0–5 V
  - Resolution: ~ 1.5 mV
  - Output current: max. 500 mA
- RST, CLK, I/O switchable to GND and VCC level
- Measurement of electrical signals
  - Voltage range of all ISO contacts 0–5 V
  - Current at VCC (two measurement ranges): resolution up to 6 µA

### SWP/HCI Interface Testing

- Terminal simulation according to
  - ETSI TS 102 613 (SWP)
  - ETSI TS 102 622 (HCI)
- S1/S2-signal at C6 contact:
  - Voltage measurement at S1: 0–5 V
  - Current measurement at S2: 0–2 mA
  - Adjustable digital parameters

### IC-USB Interface Testing

- Terminal simulation according to ETSI TS 102 600 C4/C8 signal:
  - Adjustable digital parameters
  - Monitoring/measurement of digital states

### Monitoring and Analysis

- Display and analysis of communication
  - During test case execution using Connectivity Test Center
  - Between cards and devices using Interoperability Test Center
  - On all layers (physical, protocol, transport, and application layer)
- Synchronization between layer views
- Various on-the-fly protocol checks
- Summary view: showing synchronized high-level information in one compact all-protocol master view

### ISO/IEC 7816 Monitoring

- Provides a comprehensive and interpreted insight into the card application toolkit communication (e.g. structured view of terminal profile)

### SWP/HCI Monitoring

- Based on ETSI TS 102 613/ETSI TS 102 622
- SHDCL
- Contactless tunneling (CLT)

### IC-USB Monitoring

- Based on ETSI TS 102 600
- Monitor of bytes/frames/bus states
- Supported IC-USB modes: ICCD, Ethernet Emulation Module, Mass Storage

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## TEST SUITES

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### ISO/IEC 7816 Test Benches

(protocol/application)

- Spectro 2 3GPP TS 31.122 UICC/USIM
- Spectro 2 3GPP 51.017 SIM
- Spectro 2 3GPP ISIM
- Spectro 2 3GPP2 CSIM
- Spectro 2 3GPP2 C.S0049-0 R-UIM

### SWP/HCI Test Benches

- Spectro 2 ETSI TS 102 694-2 SWP
- Spectro 2 ETSI TS 102 695-2 HCI

### Java API Test Benches

- Spectro 2 ETSI TS 103 115 HCI API
- Spectro 2 3GPP TS 51.013 SIM Java API
- Spectro 2 3GPP TS 31.213 USIM Java API
- Spectro 2 ETSI TS 102 268 UICC Java API

### GlobalPlatform Test Benches

- Global Platform eUICC M2M Card Compliance

### SIMalliance Test Benches

- SIMalliance eUICC M2M Profile Package
- SIMalliance eUICC Consumer Device Profile Package

### GSMA Test Benches

- GSMA SGP. 23 RSP eUICC

### Others

- Spectro 2 Card Profile

## GENERAL FEATURES

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- Supported smart card voltages: 1.2 V/1.8 V/3 V/5 V
- Supported technologies: 2G, 3G, LTE (incl. SIM/SAT, USIM/USAT, CSIM/CCAT, and ISIM)
- Automatic firmware update via USB interface
- Contact Card Testing API: allowing customized simulation actions

## OPTIONS

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### Universal Translator

- Supports GSM, W-CDMA, LTE, CDMA2000 (incl. SIM/SAT, USIM/USAT, CSIM/CCAT, and ISIM)

### NFC Synchronization Package

- COMPRION SyncBus:  
Enables the synchronization with the NFC testing devices CLT Move and CLT One

### Analog Scope

- Integrated 50 MHz digital storage oscilloscope
- Analog voltage measurements (res. ~1.8 mV) on contacts: VCC, RST, CLK, I/O, and SWP (C6)
- Analog current measurements on contacts VCC and SWP (C6)
- Adjustable recording depth: 4 k–16.7 M samples

### Analog Scope Viewer

- Visualization of the analog signals on all contacts
- Display of up to 16 digital and two analog channels
- Signal and frequency analysis
- Quick measurements
  - Rise and fall times
  - Peak-to-peak
  - Top/bottom
  - Duty cycles

### OTA View

- Shows translated OTA traffic on all transport protocols (HTTP/CAT\_TP/SMS-PP)

### External IO

- Interface for external I/O signals (IO Probe)

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## DIMENSIONS

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- W x D x H: 180 x 180 x 48 mm
- Weight: 2.2 kg

## SCOPE OF DELIVERY

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- Spectro 2
- Flex adaptor types A-D (terminal connectors)
- Plug-in SIM adaptor (PISA)
- USB 2.0 cable
- Power supply (12 V/2 A DC) incl. adaptor plug set

## HOST REQUIREMENTS

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- Processor: min. 2 GHz (2 x 1.5 GHz dual core or more recommended)
- RAM: min. 4 GB
- Hard disc: min. 500 MB
- USB Interface: min. USB 2.0 high-speed
- Supported OS: Windows 7, Windows 8/8.1, Windows 10



COMPRION GmbH  
Lise-Meitner-Str. 3  
33104 Paderborn  
Germany

Phone: +49 5251 6859 0  
E-mail: [info@comprion.com](mailto:info@comprion.com)  
[www.comprion.com](http://www.comprion.com)