

## CL Verify A

Validation of Contactless Interfaces



CL Verify A is the central component of COMPRION’s modular CL Development Line, designed for the development and testing of contactless interfaces. It can be used to test a wide variety of NFC-enabled devices, including car door handles, NFC readers for access or transit, banking cards, wearables, and IoT modules.

CL Verify A ensures reliable performance and interoperability before market release by offering a comprehensive range of analysis tools, such as waveform analysis, vector field measurement, and reader sensitivity tests. It

captures the complete communication exchanged over the contactless interface, with data acquisition facilitated by an integrated digital storage oscilloscope. A variety of pre-set triggers and support for NFC or ISO commands further simplify testing.

CL Verify A is compatible with multiple COMPRION software solutions, making it ideal for capturing, debugging, and testing devices for (pre-)certification in compliance with NFC Forum, GCF, EMVCo, CCC, and ISO (CEN) standards.

### Capabilities

- Simulation of contactless communication
- Monitoring/capturing contactless communication
- Supported standards:
  - NFC Forum,
  - EMVCo,
  - ISO/IEC 14443, ISO/IEC 18092, ISO/IEC 15693
- Digital storage oscilloscope
- Vector field measurement (with Vector Field Probe and Design Validation Center)
- NFC reader sensitivity
- Remote control capability for Device Test Center use cases

### Use Cases

- Analyzing NFC fields
- Debugging of NFC-enabled devices incl.
  - Contactless cards, tags or fobs
  - Contactless wearables
  - Contactless terminals/readers
  - Contactless frontends (CLFs)
  - IoT modules with NFC interface
- Pre-conformance testing according to NFC Forum, EMVCo, and GSMA TS.27
- Car Connectivity Consortium conformance testing
- Interoperability testing of contactless interfaces
- Quality Assurance

# Specification



## TECHNICAL DATA

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### Output Channel

- T (Terminal): Reader simulation up to 30 dBm
  - ISO/IEC 14443, ISO/IEC 18092, ISO/IEC 15693
  - NFC Forum, EMVCO
- C (Card): Card simulation
  - ISO/IEC 14443, ISO/IEC 18092, ISO/IEC 15693
- P (Preamplifier): for external RF power amplifier
  - Up to 22A/m with CL Amplify (400w) depending on antennas, step width of field strength <0.5 A/m
  - Aux: Trigger out (1 V level at 50 Ω)

### Input Channel

- M / R: Measuring input for NFC signals
  - High dynamic range
  - Automatic Gain Control
  - Carrier frequency synchronization
  - Resolution per sample: 12 bit
  - Record length up to 32 M sample points
  - Monitoring of bit rates from 106 kbit/s up to 848 kbit/s
  - Time measurement resolution: 1 / 54 MHz

## CAPABILITIES

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### Monitoring

Tracings of communication between devices, tags, cards according to:

- NFC Forum Digital Protocol, LLCP, SNEP
- NFC Forum application protocol: NDEF, RTD
- NFC tag types 1-5
- ISO/IEC 14443 (A/B)
- ISO/IEC 18092, ISO/IEC 15693, ISO/IEC 18745-2

### NFC Simulation

- Support for all NFC modes: card emulation, reader/writer, peer-to-peer
- Simulation of polling and listening mode for NFC-A, NFC-B, NFC-F, NFC-V
- Simulation of PICCs and PCDs as per ISO/IEC 14443 (A/B), ISO/IEC 18092, ISO/IEC 15693 ISO/IEC 18745-2 and EMVCo (L1)
- Support for higher bit rates (up to  $f_c/16$ ; 848 kbit/s)
- Hardware supporting Waiting Time Extension requests (WTX)
- Configurable protocol/timing parameters
- Timebase stability: 2.8 ppm

## HOST REQUIREMENTS

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- Processor operating frequency: min. 2 GHz (2 x 1.5 GHz dual core or more recommended)
- RAM: min. 4 GB (8 GB recommended)
- Hard disc (available space): min. 10 GB
- USB interface: min. USB 2.0 highspeed
- Windows 11

### Live Scope (with Design Validation Center & CL Quantify)

### Analog Scope (with Device or Interoperability Test Center)

- Integrated digital storage oscilloscope
- Detailed timing and value measurements
- 2-stage cascading trigger definition
- Signal/frequency analysis
- Visualization of the modulated carrier amplitude and the envelope signal
- Configurable envelope calculation
- Display of up to 4 digital channels
- Quick measurements according NFC Forum, EMVCo and ISO specification
  - Modulation index
  - Waveform characteristics
  - Frequency spectrum
  - Fall/rise times
  - Peak-to-peak
  - Top/bottom
  - Duty cycles
  - Overshoots, undershoots
  - Low level, mid level, high level

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## DIMENSIONS

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- W x D x H: 241 mm x 274 mm x 44 mm
- Weight: 2,2 kg

## INTERFACES

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- USB Socket for USB 2.0
- Ethernet LAN

## SCOPE OF DELIVERY

- CL Verify A
- Mounting kit for 19" racks
- Two 50 Ω terminating resistors (SyncBus)
- COMPRION SyncBus cable
- USB 2.0 cable
- Power supply (12 V / 2.5 A DC)

## ADDITIONAL SOFTWARE

- Interoperability Test Center  
Sniff into NFC communication
- Device Test Center  
Test compliance with NFC Forum, EMVCo, CCC, and ISO or create your own tests using NFC Test Designer
- Design Validation Center  
Analyze an NFC field at self-defined positions or run the oscilloscope with predefined triggers and automatic verification according to standards
- COMPRION MoVie  
Free software to view and share results

## ACCESSORIES

- Vector Field Probe
- Monitoring Antennas
- NFC Forum Reference Antennas
- EMVCo Test Equipment
- ISO 10373-6 Test PCD Assemblies
- ISO 10373-6 TEST PICC Classes 1-6
- Digital Antennas (C&T-Type, C&T-Type XL)

## TEST SUITES

### Test Benches NFC Forum

- CL NFC Forum RF Analog Test Bench
- CL NFC Forum Digital Protocol
- CL NFC Forum Tag Performance
- CL NFC Forum Tag
- CL NFC Forum LLCP
- CL NFC Forum SNEP
- CL NFC Forum WLC-L Type 2 Tag
- CL NFC Forum WLC-P Type 2 Tag
- CL NFC Forum WLC-L Type 5 Tag
- CL NFC Forum WLC-P Type 5 Tag

- CL CCC Digital Key Reader Device
- CL CCC Digital Key Card Emulation Device

### Test Benches GSMA TS.27 NFC Handset Test Book

- CL Verify A GSMA TS.27 NFC Tags

### Test Benches EMVCo

- CL EMVCo PCD L1 Analog Test Bench
- CL EMVCo COTS L1 Analog Test Bench
- CL EMVCo PCD L1 Digital Test Bench
- CL EMVCo PICC L1 Analog Test Bench
- CL EMVCo PICC L1 Digital Test Bench

### Test Benches ISO

- CL ISO 10373-6 PCD Analog Test Bench
- CL ISO 10373-6 PCD Digital Test Bench
- CL ISO 10373-6 PICC Analog Test Bench
- CL ISO 10373-6 PICC Digital Test Bench
- CL ISO 18745-2 PICC Analog Test Bench
- CL ISO 18745-2 PICC Digital Test Bench
- CL ISO 16794-2 PICC Analog Test Bench
- CL ISO 6794-2 PICC Digital Test Bench

### CCC Digital Key

- CCC Approved Digital Key Test Bench (NFC)

