



HP Smart Card Technology

Experience enhanced security, authentication, and more with built-in intelligence



Details

General description

Authentication and data storage system for secure integration of printer and print and ink cartridges

Physical components

Host and component smart cards on printer and supply, respectively

Smart Card IC description

Secure design incorporating microprocessor, ROM, RAM, EEPROM that is hardened against physical, side channel, and fault injection attacks

Connections

I²C interface

Firmware

Processor- and OS-agnostic SPS-provided SW development kit

Cryptographic algorithm

Based on 128-bit Advanced Encryption Standard

Memory capacity

256 bytes

HP Smart Card technology (secure micro-controller) is an authentication and secure memory solution for thermal inkjet printing supplies. Use of the technology creates a total printing system in which printer hardware and firmware can authenticate the print and ink cartridges using advanced cryptographic algorithms. The system has secure memory for storing important identification and operating information, such as optimized printing parameters for each specific ink type and remaining ink level. Several memory locations can be programmed with data specific to the printer, ink supply, ink, and the OEM.

Given the sophistication of this technology and what it enables, users can count on a solution that:

- Offers bank-level security, including EAL5+ security certification
- Is used in over 2 billion HP branded print and ink cartridges
- Is supported by HP and its multi-discipline team, including cryptography industry experts

Rely on accurate supplies data

HP's Smart Card technology offers a variety of benefits to both the supplier and consumer of thermal inkjet supplies, including:

- Supply source authentication
- Ink parameter storage
- Ink and print cartridge use tracking
- Reordering information
- Warranty management



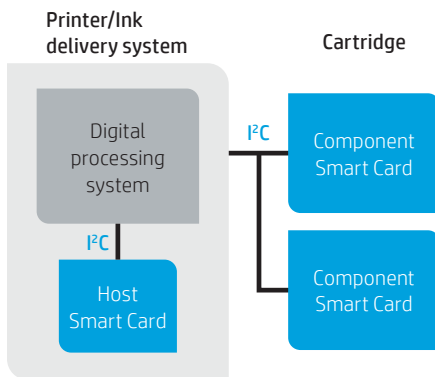
HP Smart Card implementation

HP Smart Card technology includes a host Smart Card (residing on the printer PCA and interfacing to the printer's digital processor) and a component Smart Card (residing on each cartridge/supply). SPS-provided source code enables authenticated communication between printer and supplies.

Three types of memory (RW→RO, non-resettable, and RW) are reserved for OEM-specified data.

A Smart Card development kit is available, including everything needed to evaluate and develop Smart Card technology:

- Development board with host Smart Card
- Printhead driver board
- Printhead stall
- Sample print and ink cartridges with component Smart Card
- I²C cables
- Smart Card software development libraries
- Documentation (reference designs, schematics, programming guide, source code, CAD models)



SPS Smart Card memory map


Memory grouping description	Notes
• Dry print cartridge manufacturing data	Programmed and locked by HP at the point of print cartridge manufacturing
• Dry print cartridge specific data	
• Ink fill manufacturing data	Programmed and locked by the ink filler at the point of ink filling
• Ink data and properties	
• Filled print cartridge specific data	
• Supply first installation data	Programmed and locked by the printer at first install
• OEM data	8 Bytes programmed by the printer and locked at a point chosen by the OEM
• Trademark data	Programmed and locked by HP or OEM or ink-filler
• Ink use and warranty information	Ink level and use parameters updated by the printer
• OEM non-resettable	8 Bytes
• HP RW Read/Write	General R/W memory defined by HP
• OEM RW Read/Write	8 Bytes general R/W memory used by OEM

• HP defined | •OEM defined

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