

Contactless Payments Glossary

Contactless smart chip

An integrated circuit (IC) that includes a secure microcontroller or equivalent intelligence and internal memory, and communicates with a reader through a radio frequency (RF) interface. Contactless smart chip technology, a form of proven smart card technology, is used increasingly in applications that must protect personal information and/or deliver fast, secure transactions. Leveraging many years of smart card security developments, contactless smart chips have the ability to store, protect, manage, and provide access to secure data and to support the security protocols and algorithms required by an application. In addition, contactless smart chip technology delivers the convenience, durability, and reliability required by applications that must support fast transaction throughput in demanding environments. The contactless interface provides users with the convenience of allowing the contactless device to be read at short distances with fast transfer of data. Contactless smart chip technology is available in a variety of forms – plastic cards, watches, key fobs, documents, and other handheld devices such as mobile phones.

Dual-interface smart chip

A single smart chip that has two interfaces – contact and contactless – and shares memory and chip resources. A payment card with a dual-interface smart chip can be used with either a contact reader (where the card is inserted into the reader) or with a contactless reader (where the card is tapped on or waved close to the reader).

Encryption

The process of translating information into a code that can only be read if the reader has access to the key that was used to encrypt it. There are two main types of encryption – asymmetric (or public key) and symmetric (or secret key).

Form factor

The physical device that contains the contactless smart chip and antenna and that is used by the consumer for payment. Contactless payment devices can come in a variety of form factors, including plastic cards, key fobs, wristbands, wristwatches, PDAs, and mobile phones.

ISO/IEC 14443

The international standard for contactless smart chips and cards that operate (i.e., can be read from or written to) at a distance of less than 10 centimeters (4 inches). American Express, MasterCard, and Visa contactless payment devices are based on this standard.

Microcontroller

A highly integrated computer chip that contains all the components comprising a controller. Typically this includes a central processing unit (CPU), random access memory (RAM), some form of read-only memory (ROM), input/output ports, and timers. Unlike a general purpose computer, a microcontroller is designed to operate in a restricted environment.

NFC – Near Field Communication

A short-range wireless standard (ISO/IEC 18092) that uses magnetic field induction to enable communication between devices when they are brought close together (within 10-20 centimeters or 4-8 inches). NFC technology is compatible with ISO/IEC 14443-based technology.

Range

The distance from which a contactless payment device can be read. American Express, MasterCard and Visa contactless payment devices are designed to comply with the international standard, ISO/IEC 14443, that restricts the device range to less than 4 inches (10 centimeters).

Reader

The electronic device that connects to, provides power to and communicates with a contact or contactless smart card. Contactless readers generate in electromagnetic field. When a contactless device is brought into the reader's electromagnetic field, the contactless smart chip is powered on, a wireless communication protocol is established between the card and reader, and data can then be exchanged. For contactless payments, contactless readers used at merchant locations integrate with point-of-sale terminals and comply with the ISO/IEC 14443 international standard.

Radio frequency (RF)

Any frequency within the electromagnetic spectrum associated with radio wave propagation. Many wireless communications technologies are based on RF, including radio, television, mobile phones, wireless networks and contactless payment cards and devices.

RFID tag

Simple, low-cost and disposable electronic devices that are used to identify animals, track goods logistically and replace printed bar codes at retailers. RFID tags include an integrated circuit that typically stores a static number (an ID) and an antenna that enables the chip to transmit the stored number to a reader. When the tag comes within range of the appropriate RF reader, the tag is powered by the reader's RF field and transmits its ID to the reader. There is little to no security on the RFID tag or during communication with the reader. Typical RFID tags can be easily read from distances of several inches (centimeters) to several yards (meters) to allow easy tracking of goods.

Smart card

A device that includes an embedded integrated circuit that can be either a secure microcontroller or equivalent intelligence with internal memory or a memory chip alone. The card connects to a reader with direct physical contact or with a remote contactless RF interface. With an embedded microcontroller, smart cards have the unique ability to store large amounts of data, carry out their own on-card functions (e.g., encryption and digital signatures) and interact intelligently with a smart card reader. Smart cards are available in a variety of form factors, including plastic cards, Subscriber Identification Modules (SIMs) used in GSM mobile phones, and USB-based tokens.

Transponder

A wireless communications device that detects and responds to an RF signal.