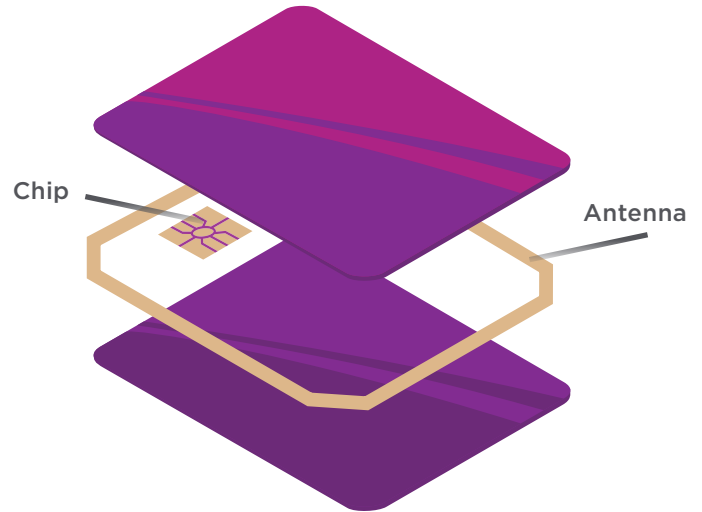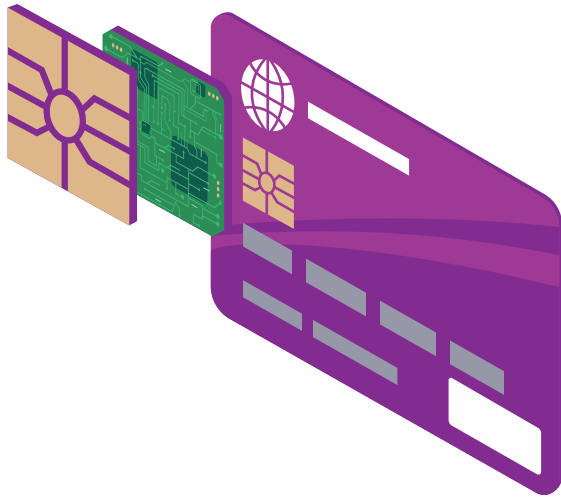# Contactless and Smart Card Basics

Chip

Antenna

THE CARD - CONTACT

Benefits

- Ability to perform a secure transaction

- Increase security of credentials through authentication, data encryption, and physical contact with reader

Tech specs

- Most common smart card type

- Electrical contact points on the chip's exterior

- Points are physically contacted by a device inside the reader

Applications

- Used globally in the financial industry to perform credit card and debit card transactions

- Government agencies: badges with contact chips increase logical access, including dual authentication

- Higher education payment cards and logical access, such as time and attendance, cafeteria meal plans, and library privileges

THE CARD - CONTACTLESS

Benefits

- Fast, easy, and as secure as chip-based contact transactions

- Card and device are embedded with multiple layers of security

- Capabilities for future expansion

Tech specs

- Communicates using radio frequency (RFID)

- Facilitated between an antenna in the card and a proximity coupler in the reader

- Card held up to the exterior of the reader at a certain distance

Applications

- Read-only: proximity card for building access

- Read-write: physical access and logical access, secure network logon, digital signature, encryption of IT infrastructures

- Transportation, digital enterprises, retail, education, financial, identity authorization

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Contactless and Smart Card Basics

Ethernet Connection

USB Connection

Printer   Smart Card

CONNECTIONS

Benefits

- Provides a more secure network environment

- Allows for encryption of card personalization data that is sent over the network

- Complete experience for the end-user

Tech specs

- The printers are part of a network that can be accessed by any PC residing on the network

- Through the network, all commands are sent to the smart card module and printer from the PC

Applications

- Typically used in financial issuance of credit and debit cards

- Allows customers with a campus environment seamless and secure communication across their network

- Often used in education markets and corporations issuing credentials

LOOSELY COUPLED SOLUTION

Benefits

- Local access where networking is not possible

- Ability to be backwards compatible with previous applications using Entrust loosely coupled encoders

Tech specs

- Printer has two connections to the PC

- "Printer" connection delivers commands for card movement, magnetic stripe operation, and printing

- "Reader" connection is exclusively designed for smart card reader/chip commands

- Termed "loosely coupled" because the printer and reader connections operate independently

Applications

- Required for customers interested in issuing ID credentials in various vertical markets

- Ideal in remote distributed issuance applications

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Contactless and Smart Card Basics

CARD & READER INTERACTION

Creating a smart card

1. Printer encodes or reads data on the smart chip and reports it back to the PC

2. During encoding, the card's personalization information is also reported to the reader

3. The reader knows to correspond that information to the data encoded

4. The reader reports card information to the PC

Card info

Data

Read-write loosely coupled

Using a contact smart card

1. Card is inserted into a contact reader

2. Electrical points on the chip are contacted by a device inside the reader

3. Data encoded onto the chip is transferred to the reader

Using a contactless smart card

1. Card is held up to a reader that supports it

2. Antenna inside the card communicates with a proximity coupler inside the reader via radio frequency (125 kHz or 13.56 MHz)

3. Data encoded onto the chip is transferred to the reader from a certain distance

Contactless and Smart Card Basics

SPECIFICATIONS & STANDARDS

Requirements & compliances

- Entrust ensures that all of its products meet globally implemented industry standards

- PC/SC (personal computer/smart card) compliant couplers provided by Entrust include Identiv (SCM), Duali, and HID Omnikey®

EMV capabilities

- Entrust offers a wide range of encoders as an option to our card printers

- All of these printers are capable of creating cards for an EMV application

- Entrust provides a complete EMV card solution in the market, including hardware, software, supplies, and service

Software specifications

- Card personalization is controlled by a PC connection, using a driver for encoder or software development kit (SDK)

- Driver for encoder is a user interface installed on the PC; best suited for non-automated, low-volume card production

- Other existing custom-made software applications require SDK as a tool to communicate with the reader

- Entrust software suite includes native support for specific card technologies

Learn more at
entrust.com

ENTRUST

Global Headquarters
1187 Park Place, Minneapolis, MN 55379

U.S. Toll-Free Phone: 888 690 2424
International Phone: +1 952 933 1223