

SMART CARD

User Information Guide

June 2005 – Rev 4.0

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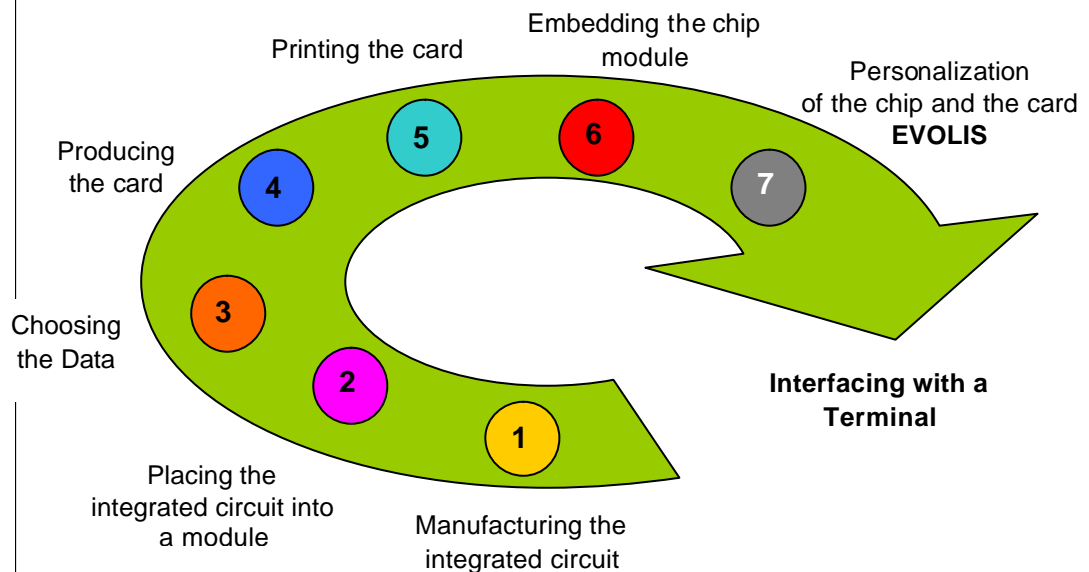
Introduction

This guide will help our customers to better understand the Smart Card Systems and develop and launch a Smart Card Solution with the Evolis Card Printer Range.

Each Smart Card Solution is unique and involves a myriad of decisions before implementation. This is the reason why we provide you hereafter with information about the Smart Card itself, about the Market applications, how it works with the Evolis Card Printers plus some useful links about the Smart Card Industry and Smart Card Solutions.

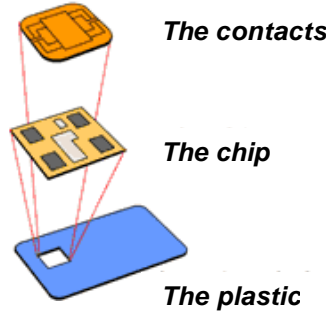
The Smart Card Creation Scheme

- **At which step does Evolis intervene in this scheme?**



What is a Smart Card?

The Smart Card Industry started 25 years ago with the first Smart Cards invented by Roland Moreno. Since then, the growth has been significant as the sales have exceeded 1 billion cards.



The Smart Card is a plastic card – about the same size as a credit card – with an embedded microprocessor chip. The chip contains a memory storing over 100 times more data than a magnetic stripe. The chip can be reprogrammed to add, delete or rearrange data.

There are many kinds of smart cards. Typically, there are two large families of Smart Cards: the Memory Cards and the Microprocessor Cards, which can store massive amounts of data.

Memory cards can be used for specific, relatively simple, prepaid applications, like bus tokens or movie tickets.

When the application gets more complex, a micro-controller-based should be considered.

Here is below a brief description of the two main types of cards:

■ Memory cards

These cards, sometimes referred as *synchronous* cards, are primarily used for information storage purposes. They are commonly used for applications such as prepaid telephone cards in public telephones.

There are no general protocols to communicate with memory cards. No international standards currently regulate the communication protocol between the cards and the terminals.

This type of cards indeed is divided into two sub-groups, which are: EEPROM Memory Cards (for storage only) and Memory Cards with Registers.

An EEPROM Memory card is a storage card with rewritable memory. These cards are used to store information such as a buyer profile for loyalty card programs, or database information that might be carried from one application to another.

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Memory cards with registers have a very limited memory capacity. The registers use hard-wired logic to decrement a large number through a series of successive counter-stages with decreasing values. When all the counters-stages have been exhausted, there is no money or value left on the card. Since these cards are not rewritable, they are discarded.

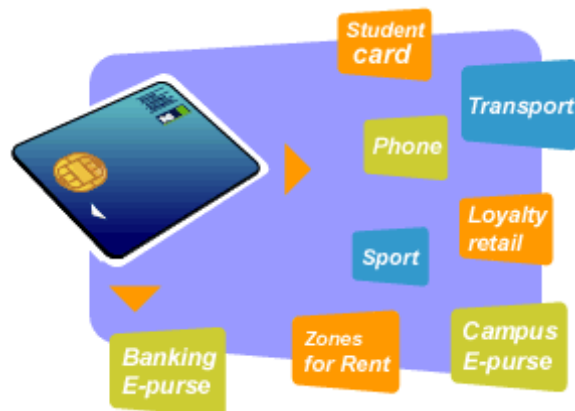
▪ Microprocessor cards

These are the truly “Smart Cards”, a-k-a asynchronous cards. They are commonly used for applications such as the Identification and the Electronic Purse.

The chip contains a Memory area that ranges from 1 kilobyte to approximately 64 kilobytes today.

In contrast to the memory cards, which do not have standardized protocols, the layout of the pins for the micro-controller card is standardized accordingly to the International Standards Organizations (ISO).

What are the market applications?



▪ Education

Today very popular in USA, in Australia and also starting in the UK: the School Cards...

One Smart Card can be used as an e-purse for School building access control, ID, computer access, making phone calls, library lending, etc...

This kind of card is the Student ID and it holds his/her campus life on a chip.

▪ Healthcare

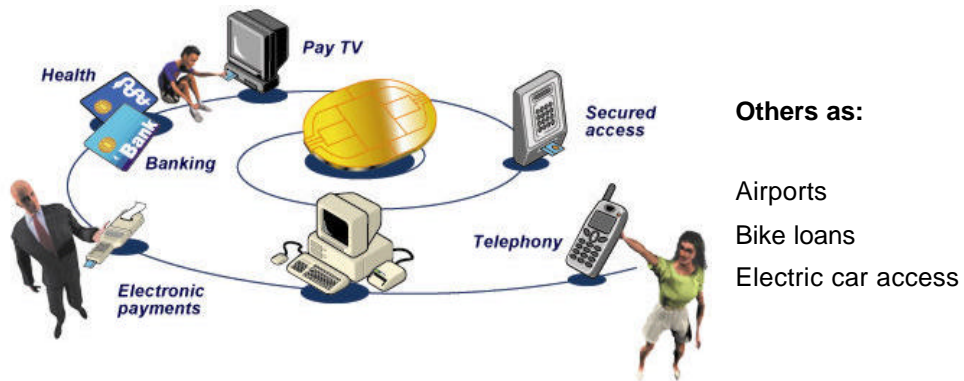
The Smart Cards can identify patients, store health information, give professionals remote access to the information and facilitate insurance reimbursement. They also decrease administrative costs and increase security in private companies.

■ Retail

The Smart Card gives an instant profile of each customer at the point of sale. This enables the retailers to offer rewards or incentives to customers.

The Smart Card supports re-encoding and holding the loyalty points. Loyalty cards are designed to keep customers coming back for more and more business. In a loyalty program, the Smart Card keeps in memory all of a consumer's past purchases at a participating store, and rewards them with discount and/or gifts after fulfilling a certain requirement.

One example of the loyalty card in action in the United States is Blockbuster, the giant video rental chain, offers a free movie rental after you rent five videos in a row.



Smart Card and Evolis Printer Range: How does it works?

Most of the systems Smart Cards personalization is invisible to the average card holder. The processes implemented vary in implementation and complexity depending on the type of Smart Card that is being used.

The Evolis Pebble Smart, Dualys Smart and Quantum Smart printer models offer a complete smart card personalisation solution.

Please note that an external encoding unit is required since Evolis Printers will be delivered only with a Smart Contact Station.

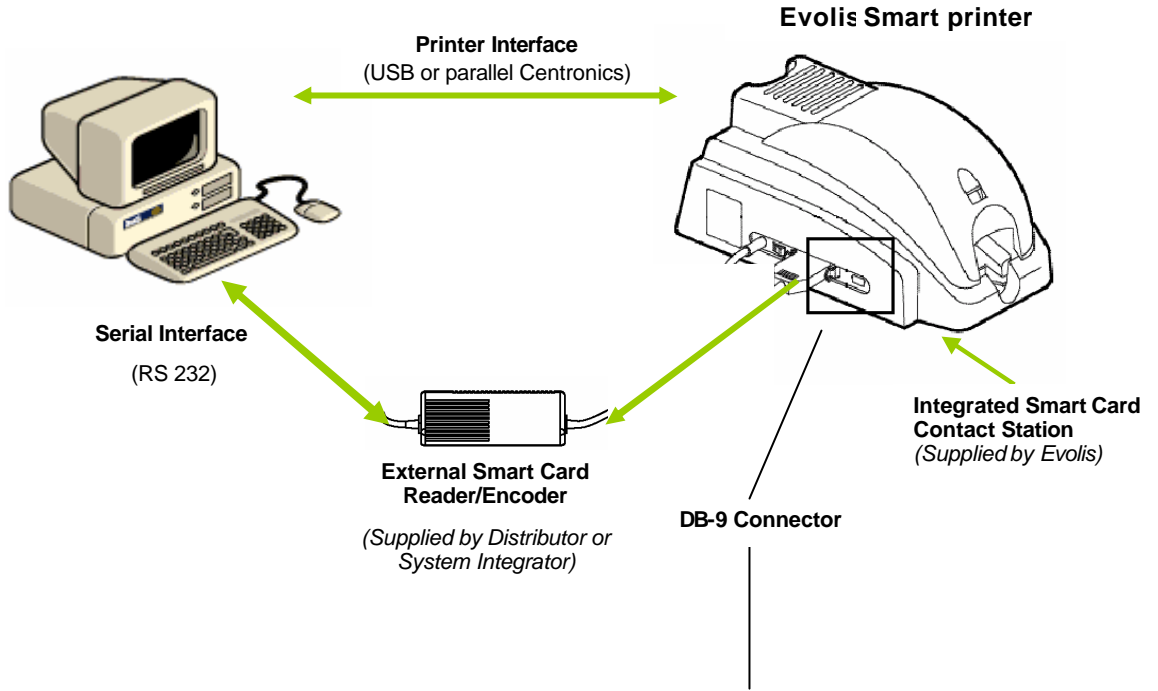
This single card personalization system provides flexibility and ability to obtain in a few minutes a finished card-in-hand.

To personalize the chip, the Pebble Smart, Dualys Smart and Quantum Smart integrate a **Smart Card Contact Station** to program the Smart Cards which complies with ISO 7816-2.

They are also equipped with a DB-9 connector at the back of the printer. This connector, which is directly linked to the Smart Card Contact Station inside the printer, is to be linked to an external reader/encoder to program the chip.

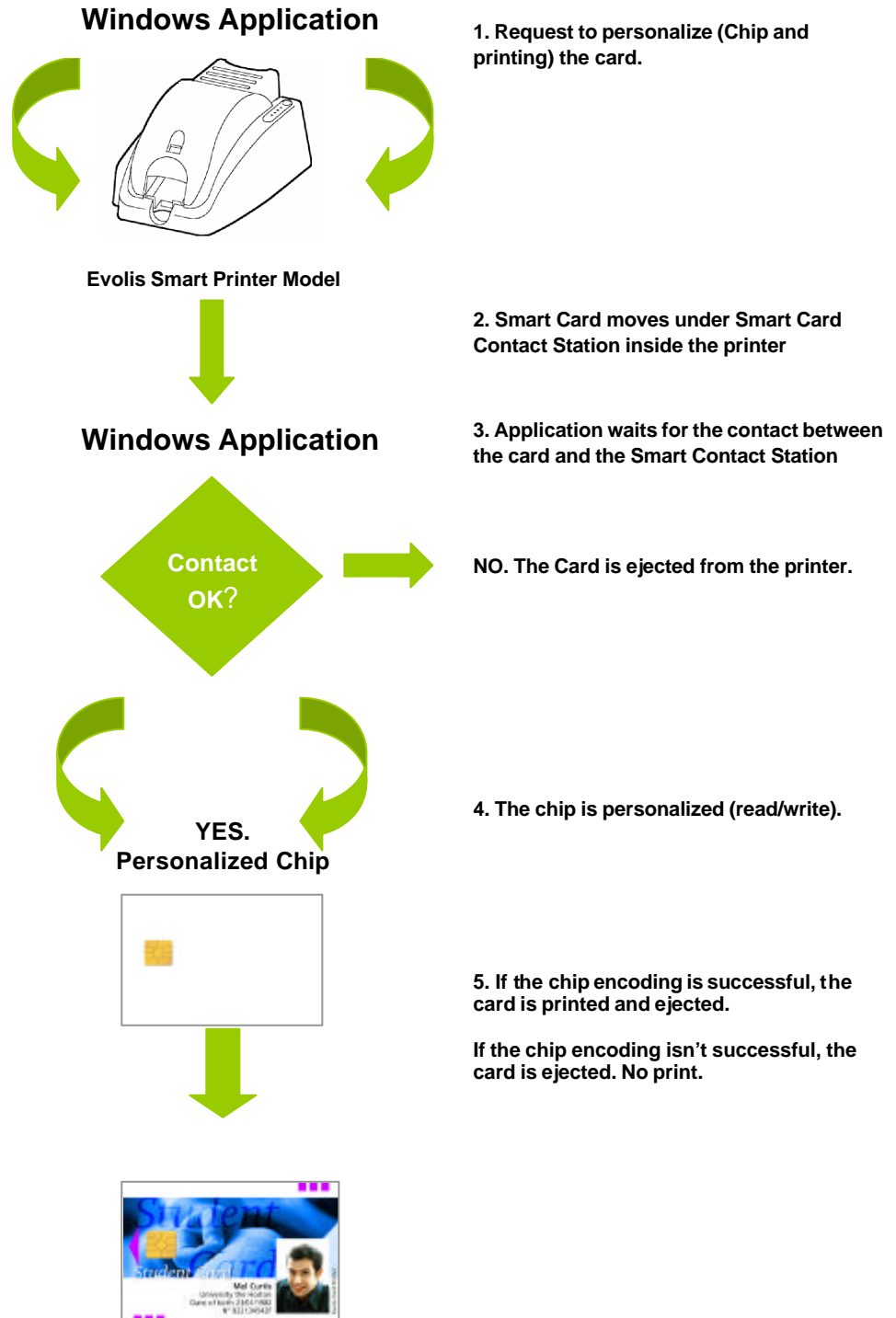
The connection interface is described hereafter:

Please note that the following drawing is valid for the Pebble card printer, however the same procedure is also implemented for the Dualys Smart and Quantum Smart card printers.



DB-9 Pins	Smart Card Contacts
1	C1 (Vcc)
2	C2 (Reset)
3	C3 (clock)
4	C4 (RFU)
5	C5 (GND)
6	C6 (Vpp)
7	C7 (I/O)
8	C8 (RFU)
9	C9 (Open) The contact is made when the chip is under the contacts.

Application interface: How does it work?



USEFUL LINKS

The references and names mentioned below will enable you to gather more information about Smart Cards. Evolis Card Printer is NOT associated with these companies which may be found on certain Websites.

SMART CARD GROUP

www.smartcard.co.uk

SCG provides international news and information about the Smart Card Market, through its hardcopy newsletter and its website.

eEurope SMART CARD

www.europe-smartcards.org

The eEurope Smart Cards initiative aims to accelerate and harmonise the development and use of smart cards across Europe.

SMART CARD ALLIANCE

www.smartcardalliance.org

The Smart Card Alliance is a not-for profit, multi-industry association working to accelerate the widespread acceptance of multiple application smart card technology.

EURO SMART – THE VOICE OF THE SMART CARD INDUSTRY

www.eurosmart.com

EUROSMART is an international association located in Brussels representing the Voice of the Smart Card Industry for multi-sector applications. The Association is committed to expanding the world's smart card market, developing smart card standards and continuously improving quality and security applications.



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