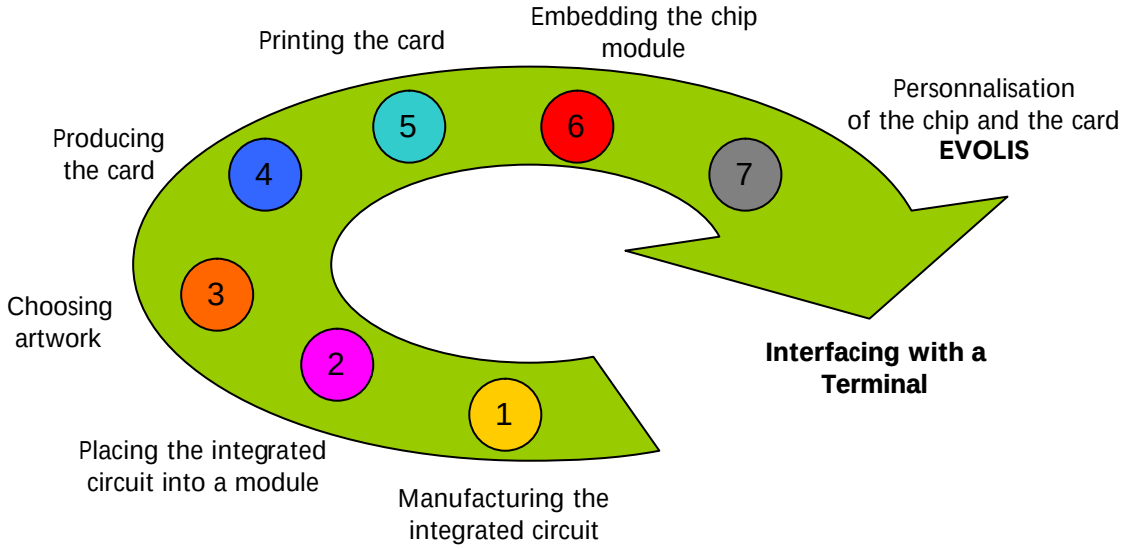
Smart Card Information Guide

Introduction

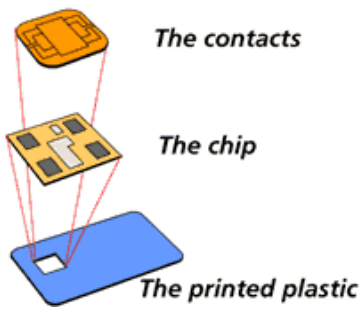
The purpose of this guide is to help our customers to better understand the Smart Card Systems and to help develop and launch a Smart Card Solution with the New Pebble SMART Card Printer.
Each Smart Card Solution is unique and involves a myriad of decisions before implementation. This is the reason you will find hereafter information about the Smart Card itself, what are the Market applications, how it works with a New Pebble SMART and some useful links about Smart Cards and Smart Card Solutions.

Where is situated Evolis in the Smart Card creation 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 which stores data information over 100 times more than a magnetic stripe. The chip can be reprogrammed to add, delete or rearrange data.

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There are a wide of smart cards. Typically, it exists two big families of Smart Cards: the Memory Cards and the Microprocessor Cards which can store massive amounts of information.

Memory cards can be used for specific , relatively simple, prepaid applications like bus tokens or movie tickets.
When the application is 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 storing information. They are commonly used for applications such as prepaid telephone cards in public telephones.
General protocols for communicating with memory cards do not exist. There are no international standards that regulate the communications protocol between the cards and the terminals.

This type of cards 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 an application to another.

Memory cards with registers have a very limited memory sizes. The registers use hard-wired logic to decrement a large number through a series of 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

The Microprocessor Cards, the truly "Smart Cards", also are also named asynchronous cards. They are also 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 according to the International Standards Organizations (ISO).

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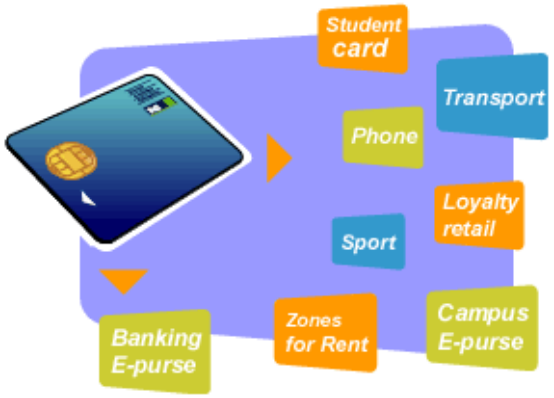
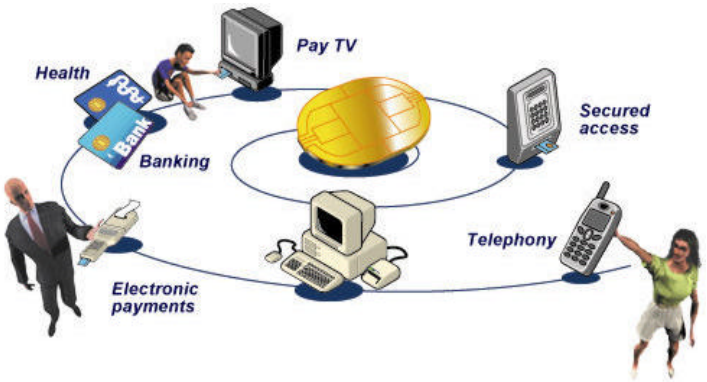
What are the Market applications ?



Education
Today very popular in USA, in Australia and now 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…
These cards are the Student ID and it holds his 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.

Retails
The Smart Card gives an instant profile of each customer at the point of sale. This allows the retailers to offer rewards or incentives to customers.
The Smart Card supports recoding and holding the loyalty points. Loyalty cards are designed to keep customers coming back for move and more business. In a loyalty program, the Smart Card remembers 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.



Others as:
Airports
Bike loans
Electric car access

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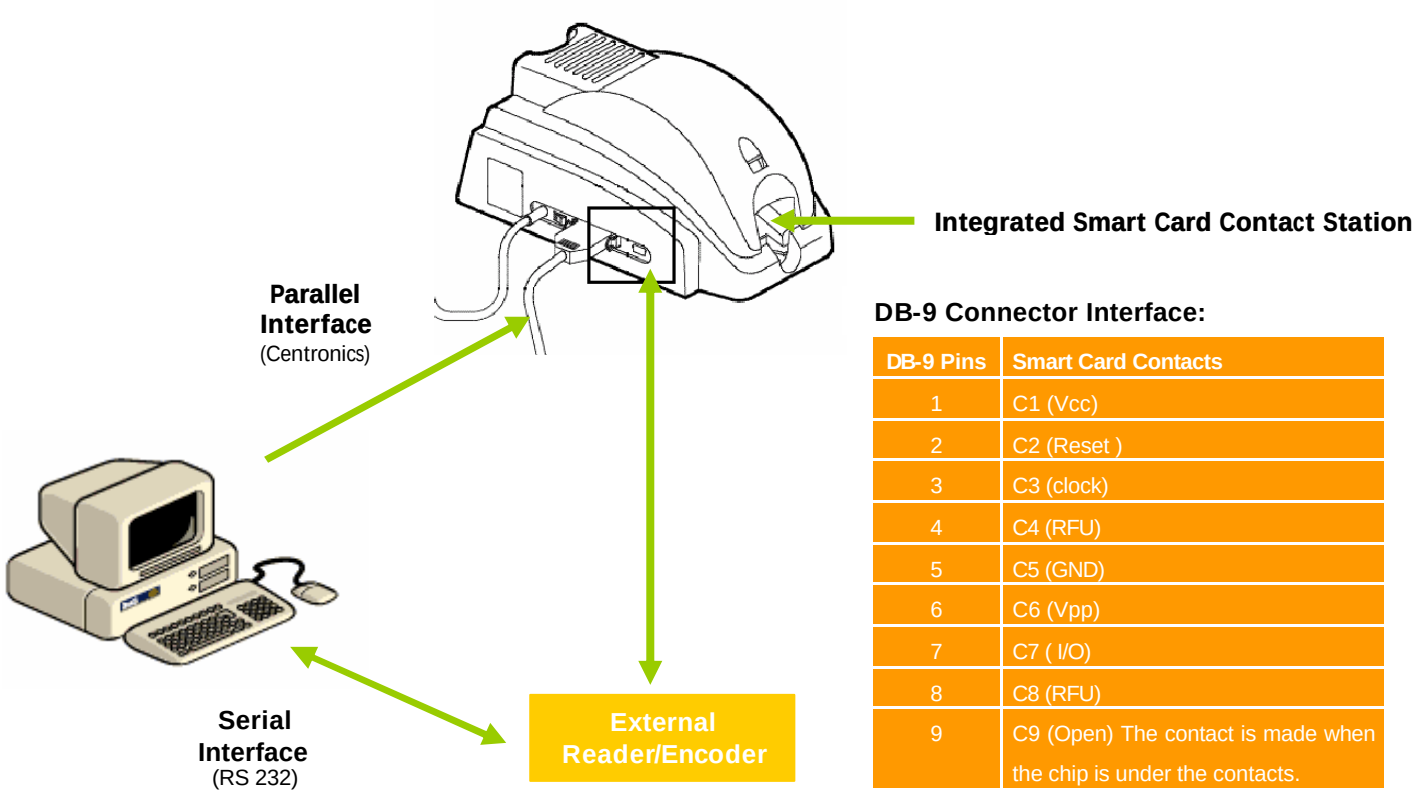
Smart Card and the New Pebble SMART – How it works ?

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

The New Pebble SMART Card Printer offers card personalisation as it codes the chip and prints on the card in one go. This single card personalisation system provides flexibility and ability to obtain in a few minutes a finished card-in-hand.
To personalize the chip, the New Pebble SMART Card Printer integrates a Smart Card Contact Station to program the Smart Cards which complies with ISO 7816-2.

It is 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 as below:



DB-9 Connector Interface:

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.

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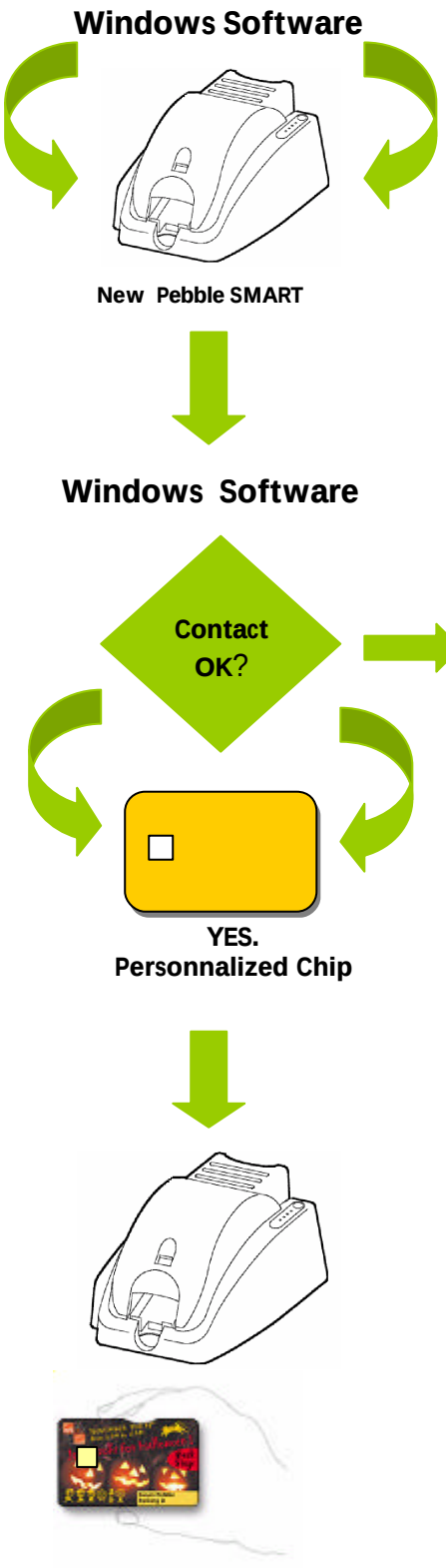
Software Interface – How it works?



1. Request to personalize (Chip and printing) the card.

2. Smart Card moves under Smart Card Contact Station

3. Software wait for the contact between the card and the Smart Contact Station

NO. The Card is ejected from the printer.

4. The chip is personalized (read/write).

5. The card is printed and ejected.