The System

The PREMIUM SERIES is a range of processes that can be physically and logically integrated to create different personalization functions.

These processes can be configured into different combined production lines in order to satisfy different needs in terms of;

- ❖ product range.
- ❖ productivity.
- ❖ simultaneous management of production batches.

The total flexibility makes the PREMIUM SERIES the ideal device to meet the personalization requirements for: banks and financial institutions, government offices, retail, transport and service bureaus.

The PREMIUM SERIES incorporates a wide range of personalization technologies: smart card encoding (contact and contactless), magnetic stripe encoding, embossing, thermal printing, and laser engraving.

The PREMIUM SERIES can process up to 3,000 cards per hour.

As a result of the innovative engineering approach, the PREMIUM SERIES is suitable for high/medium volume card issuance. However, processing of smaller batches with the same speed and efficiency is perfectly feasible.

The various processes are autonomous and fully driven and controlled by an embedded software program located inside the System Muster PC that manages all the personalization functions.

The PREMIUM SERIES features a unique card handling system that completely eliminates any scratches of the card.

The PREMIUM SERIES has been designed to minimize downtime by making every single module accessible via the front opening.

Particular attention to detail has been given to the use of solidly built/long lasting components and high quality mechanical, electric, and electronic components.
These features combined with a powerful auto-diagnosis tool (also remote-controlled) allows efficient maintenance and troubleshooting, thus minimizing TCO (Total Cost of Ownership).
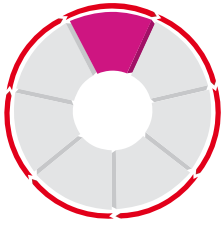
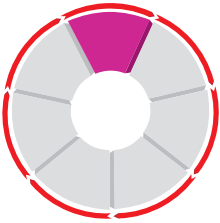**CIM** CARD IMAGING MASTER

Software Technologies

This is the core of the Premium Series architecture and contains advanced technology solutions in terms of process scheduling, optimization of the personalization activities to maximize the performance, and last but not least, control of the single or combined events that occur in automation process.

The software Zen supervises the management of the single station, the data processing and the job flow.

Main features of the production control;

❖ Data acquisition and pre-processing.
❖ Control of the single personalization station task.
❖ Control of the batch production steps.
❖ System/Station configuration.

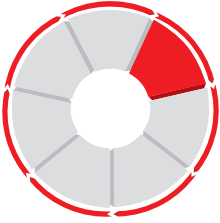## Software Technologies

INFINITY ∞

The software component that supports the graphic user interface (GUI), the IMPORT of production data, and the EXPORT of statistical data.

Main features;

- ❖ System Console.
- ❖ Job Management.
- ❖ Graphic user interface based on a multi-document framework, permitting the availability of different views of productions data and machine status at the same time.
- ❖ Data base management;
    - ✔ Production data (Import).
    - ✔ Production data (Export).
    - ✔ Log file.
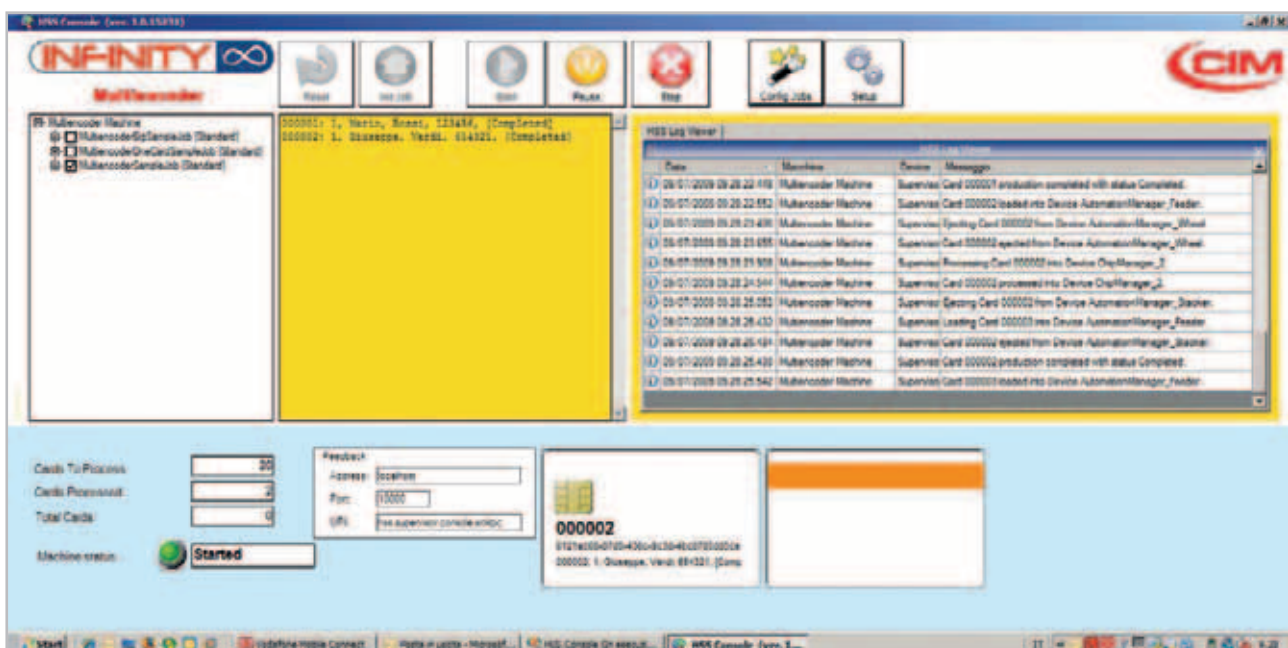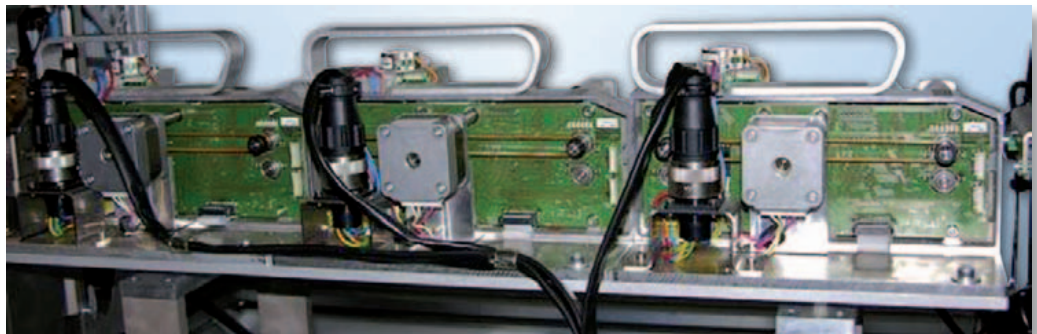
Hardware Personalization Technologies

MAGNETIC ENCODING MODULE

The magnetic encoding module is composed of two stations, the first station writes to the tracks, and the second reads and checks encoded data in a single pass. This technology allows for the personalization of one to three tracks ISO 7811 HiCo/LoCo (Read/Write) with precision, and high quality. The encoding head can be easily replaced thus minimizing module down time.

It is possible to configure up to three in-line Magnetic Encoding modules, each performing independently and in sequence;

- ❖ Writing to three tracks HICo/LOCo simultaneously.
- ❖ Track Reading and Data verification.
- ❖ Chip read/Write Single Station, Read-Back Function (optional).

Performance: up to 2,000 cards per hour.
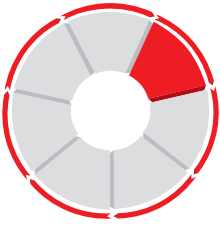
Hardware Personalization Technologies

MULTIENCODING MODULE

The electrical personalization module allows for the personalization of a variety of CONTACT and CONTACTLESS cards. Each single module contains up to 16 independent card slots located around the radius of a rotating cylindrical wheel.

Every single card is contained, during the personalization process, in a slot that has a contact terminal and a RF antenna. Inside the slot the card has two positions to communicate with the chip and the RF antenna; in case of CONTACTLESS encoding only, there is no physical contact with the card surface. The chip and the RF antenna are physically and logically independent controlled, making it possible to activate the personalization of CONTACT and CONTACTLESS simultaneously as well as independently.

Main features;

- ❖ Smart Card Encoding (Contact ISO 7816 and Contactless ISO 14443).
- ❖ Simple and efficient design.
- ❖ High speed & unsurpassed reliability – in case of slot failure the system will continue to work.
- ❖ The interface of the single control units to the management system is via Ethernet.
- ❖ Rotating joint for electrical connection – 12 routes.
- ❖ Friction belt card transportation.
- ❖ Input/output card presence optical fibre sensors.

Performance: up to 3,000 cards per hour.
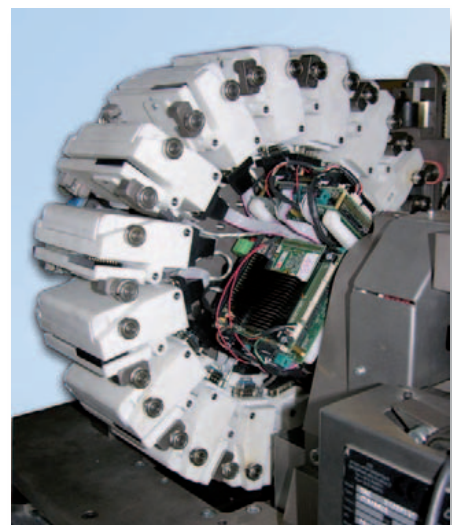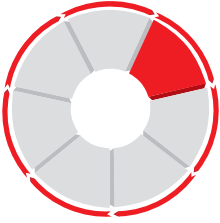
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CARD IMAGING MASTER

Hardware Personalization Technologies

LASER MARKING MODULE

The laser marking module allows the personalization of logos, alphanumeric codes, bi-three-dimensional codes (datamatrix) with high precision and reliability. It guarantees optimum efficiency on any kind of material - plastic, metal, silicon and PCB - and on both flat and uneven surfaces with high accuracy (TEM00 output with M2<1.5 and lower spot sizes than 25 microns).

The laser marking module is based on the "All in One" system: the laser cavity, the scan head and the full digital electronic control are fitted in an unique device. In addition, it is provided with an air-thermostable cooling system TEC "thermo–electric cooled" technology that ensure a constant temperature output. The estimated average laser output is over 20,000 (MTBM).

Main Features;

- ❖ DPSS "long life" technology (Diode Pummeled Solid State).
- ❖ Laser: 1064 nm, 12/20 Watt, dynamic beam expander.
- ❖ Laser emission efficiency valued at about 20.000 MBTM (hours without maintenance).
- ❖ Air-cooling system TEC (Thermo-Electric Cooled).
- ❖ Integrated Scanning head and electronic control "Full Digital".
- ❖ Working area: from 60x60 to 180x180 mm².
- ❖ Meets international security specifications (CEI EN 60825-1)
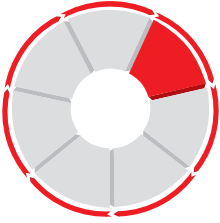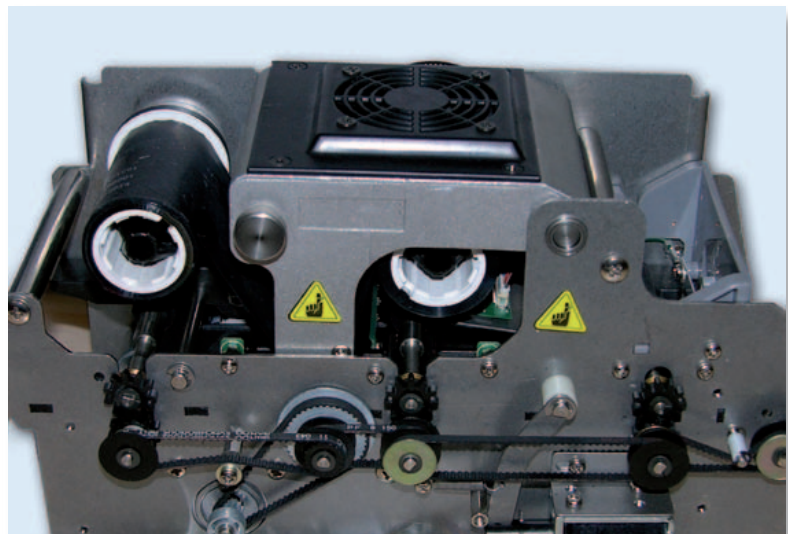
Hardware Personalization Technologies

THERMAL TRANSFER PRINTING MODULE

This module allows for the printing of full-colour and high-resolution photos, images, logos, text, generating high quality and vivid colours. It can be configured according to the various graphic personalization needed.

Main features;

- ❖ Technology: Thermal Transfer/Thermal Dye Sublimation.
- ❖ Edge-to-edge colour printing.
- ❖ Resolution 300 dpi.
- ❖ COLOUR section composed of three stations in line (YMC).
- ❖ B/W station.
- ❖ Overlay station.
- ❖ Flip Over station for dual sided printing (optional).
- ❖ In-line card cleaning station.

Performance: up to 1,800 cards per hour.
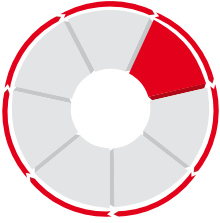
Hardware Personalization Technologies
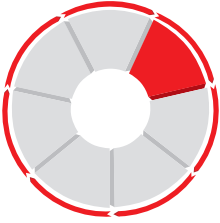
HOT LAMINATION MODULE

The Hot Lamination Module allows for the application of a protective film to the card surface to increase durability and security.

Main features;

❖ 10 micron protective coating.

Performance: up to 250 cards per hour.

Hardware Personalization Technologies
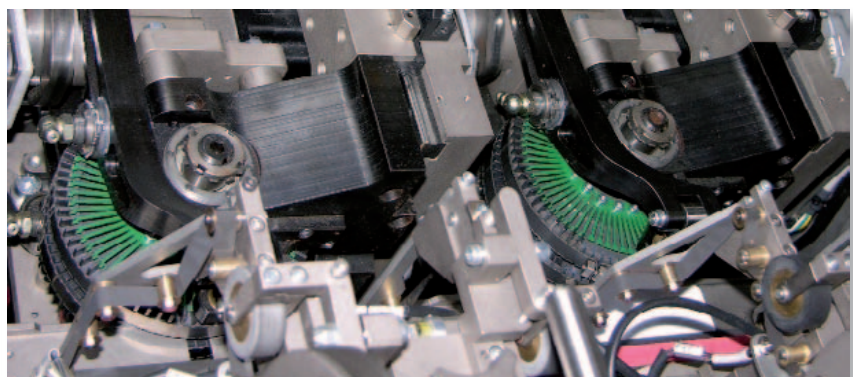
EMBOSSING MODULE

The module performs the embossing or indenting of the card with precision and high speed. The 72-character drums are extremely durable and specifically designed for high volume personalization.
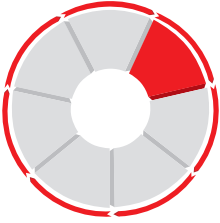
Main features;

- ❖ 72 character drum.
- ❖ To ISO 7810 standards.

It is possible to configure up to three in-line embossing modules, each equipped with a full set of embossing characters and indent characters, independently controlled by the software.

Performance: up to 1,000 cards per hour – for bank card (3 lines, 40-45 characters).
up to 2,000 cards per hour – (1 line).

Hardware Personalization Technologies

TIPPING MODULE

The tipping module allows for the coloring and improved readability of the embossed characters. The color ribbon, with a length of up to 600 meters has a yield of up to 30,000 personalized cards. The tipping parameters (temperature, pressure, dwell time) can be controlled for every single job by means of the software. In addition, the ribbon consumption can be managed and adjusted in order to minimize waste. The actual ribbon consumption can be preset and memorized for subsequent runs.

It is possible to configure up to three in-line Tipping Modules (e.g. each tipping a different colour).
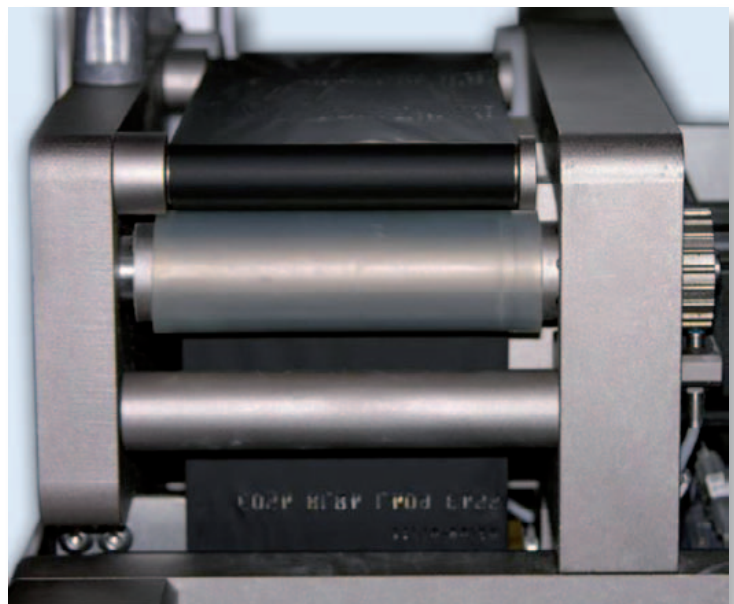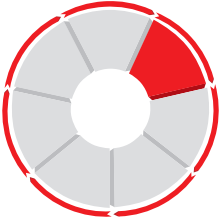
Hardware Personalization Technologies

INDENT MODULE

The indent module allows for the increased readability of the indented characters and is composed of a REAR INDENT module and a FRONT INDENT module available as front only, rear only or as front and rear configuration as an option. The color ribbon, with a length of up to 350 meters has a yield of up to 5,000 personalized cards. The ribbon consumption can be set and managed in order to minimize waste. In addition the actual ribbon consumption can be recorded for subsequent runs.

It is possible to configure up to two Indent Modules (one front and one rear) each drum.
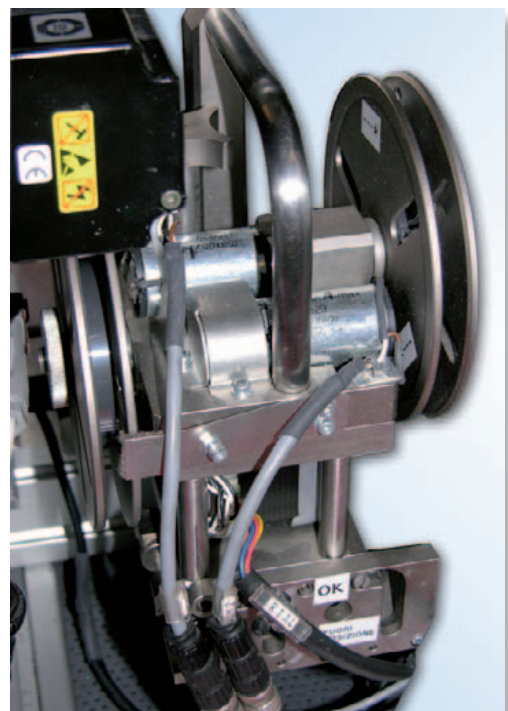
Functional Options

CARD FEEDER

The card is pushed out from the card feeder using an extraction tooth and a one-way feeding roller controlled by a dedicated DC stepper motor and near-end sensor.

Main features;

- ❖ Removable card magazine.
- ❖ Capacity up to 500 cards.
- ❖ Near-end sensor (50 cards).
- ❖ Card presence/absence sensor.
- ❖ Card tracking with anti-scratch coating.

CARD FEEDER HE

The card feeding is controlled pneumatically. This prevents scratches on the card and assures the feeding of only one card at the time.

Main features;

- ❖ One hopper (loading/unloading) with a capacity up to 500 cards.
- ❖ Near-end sensor (50 cards).
- ❖ Functions vertically and horizontally.
- ❖ Vacuum Pump.

The module can be configured with up to four independent Card Feeders.


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Functional Options

LINEAR SHIFTER

The linear shifter allows the picking and placing of a single card from one position to the next along a linear axis. The shifter function is available throughout the personalization process line of operation.
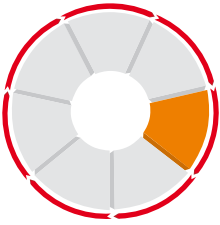
Examples:

1. The linear shifter collects cards from different feeders and forwards them to a process line.
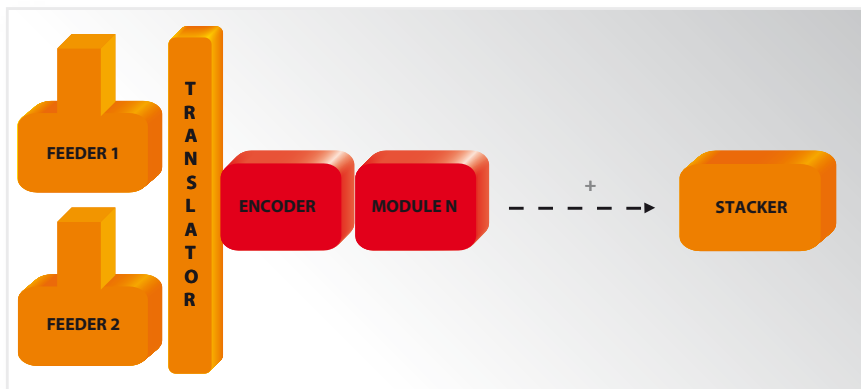
2. The linear shifter picks the cards with a single feeder device and forwards them on two parallel process lines.
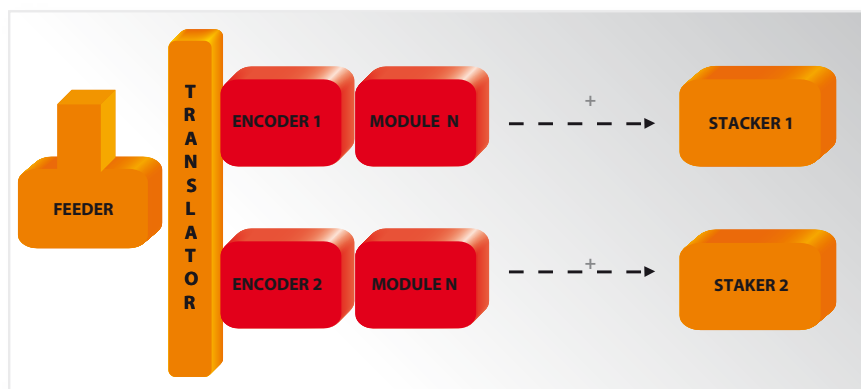
Functional Options

TRANSPORT AND POSITIONING MODULE
(only for laser and visual inspection stations)

This module has fast bi-directional transportation and positioning of the card with the advantage of leaving both sides of the card completely free. The card transportation system operates by means of two friction driven belts controlled by a dedicated stepper motor. The module includes a card input/output optical fibre sensor in addition to a special module capable of tilting the card around the "X" and "Y" axis (MLI, CLI), can be added on demand to the configuration.
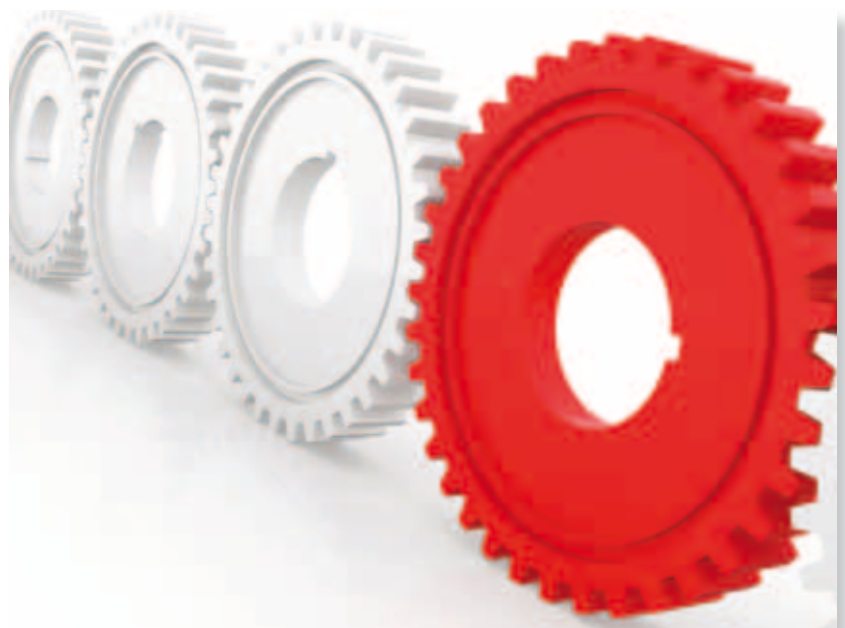
Functional Options

VISION INSPECTION & DATA COLLECTION MODULE

The Vision inspection module is installed inside the card transport system and can be positioned anywhere along the card processing line. The most common positions are after the card feeder and at the end of the personalization process to verify the personalized data.

Main features;

- ❖ From 1 to 4 CCS high resolution cameras (colour or B/W).
- ❖ Inspection of card graphics.
- ❖ OCR reading.
- ❖ Inspection of logical data.
- ❖ Inspection of graphic elements (reconciliation and quality).
- ❖ Tracking of single images and image storage (optional).
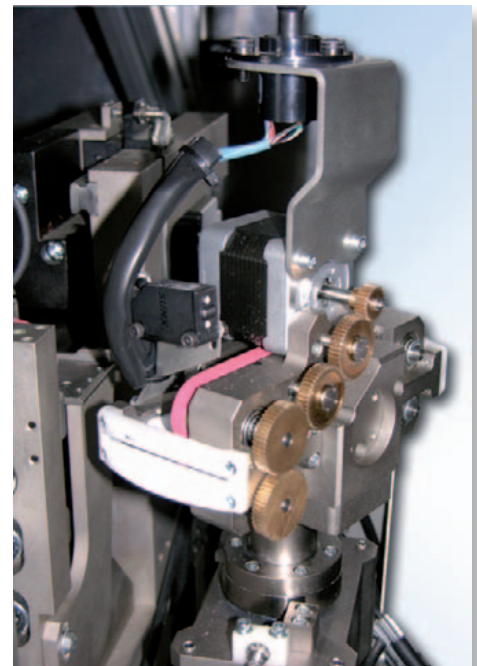

CIM
CARD IMAGING MASTER
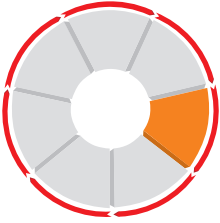
Functional Options

ROTOFLIP MODULE

The Rotoflip is used for a card to change direction or flipping it while in process along the "Y" and "Z" axis.

Features;

- ❖ The card can rotate +/- 180° (Z axis).
- ❖ The card can be flipped +/- 180° (Y axis).
- ❖ Card input/output optical fibre sensor.

Functional Options

STACKER

Allows for the personalized cards to be collected and moved to the trays, one for good cards (capacity up to 450 cards) one for rejected cards (capacity up to 80 cards).

Main features;

- ❖ Three stepper motors: deflector, card transport and flip over with home sensor and card presence sensor.
- ❖ Camera or OCR reader (optional).
- ❖ Full load stacker sensor.

STACKER HE

This device is symmetric to the feeder HE and uses the same storage dispenser. The card transportation is pneumatically controlled. The design of the Stacker HE prevents scratches on the cards.

Main features;

- ❖ Functions horizontally and vertically.
- ❖ Stepper motor with home sensor.
- ❖ Vacuum Pump.

The system can be configured with up to four independent feeders.

CIM
CARD IMAGING MASTER
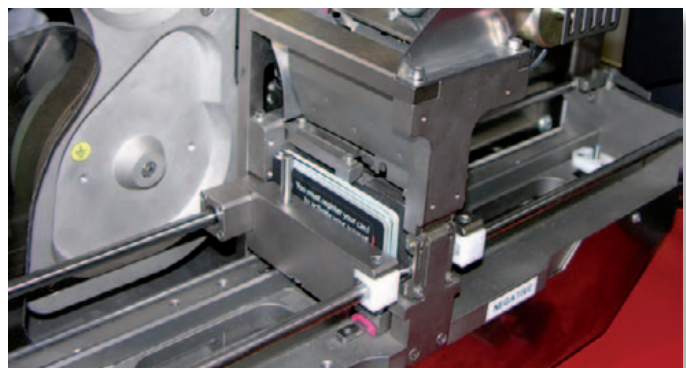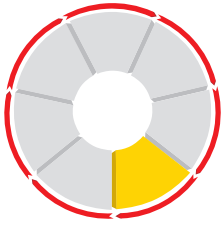
PREMIUM SERIES

High Performance Card Personalization System – Engineered to Perfection

Hardware & Middleware Automation Technologies
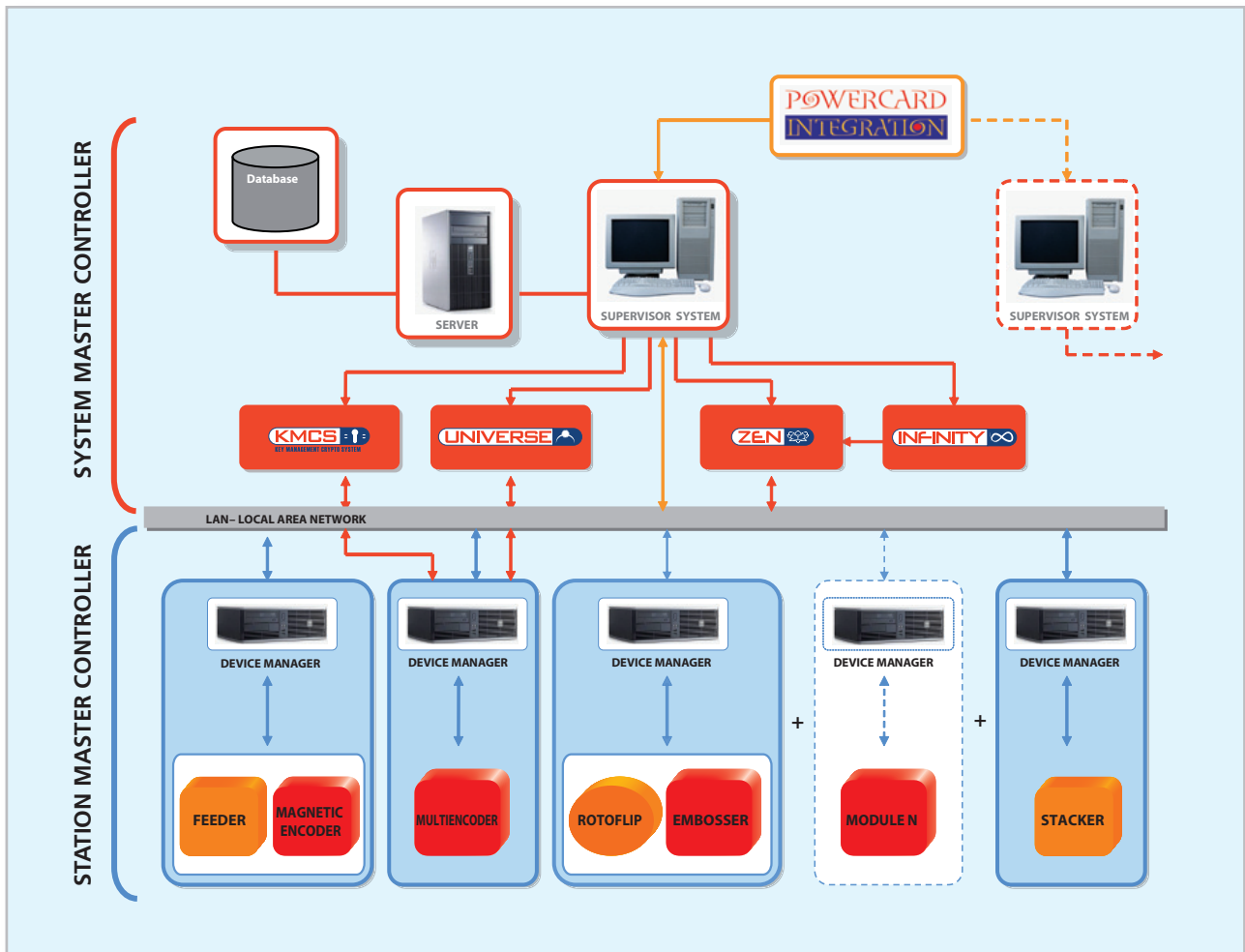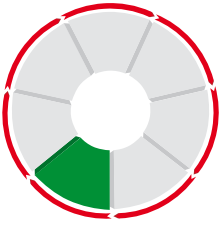
SYSTEM MASTER CONTROLLER

POWERCARD INTEGRATION

Database

SERVER

SUPERVISOR SYSTEM

SUPERVISOR SYSTEM

KMCS — KEY MANAGEMENT CRYPTO SYSTEM

UNIVERSE

ZEN

INFINITY

LAN– LOCAL AREA NETWORK

STATION MASTER CONTROLLER

DEVICE MANAGER

DEVICE MANAGER

DEVICE MANAGER

DEVICE MANAGER

DEVICE MANAGER

FEEDER | MAGNETIC ENCODER

MULTIENCODER

ROTOFLIP | EMBOSSER

MODULE N

STACKER

+   +

Middleware Technologies

Universe is a Software Development Kit (S.D.K.) based on a JAVA multi-platform system, which allows you to design and develop smart card personalization software applications. It is composed of two core libraries managing both the data flow from Zen (the system supervisor) to the Chip personalization process, and the actual communication with chip personalization devices.

Main features of the structure;

- ❖ Library CardLib: for processing and implementing all data related to the card.
- ❖ Library CardDeviceLib: for implementing the communication with the chip reading devices (Contact and C/Less).
- ❖ Library ChipManager: for implementing communication with the supervisor ZEN.
- ❖ Library CardPlugin: including a chip personalization Software prototype.
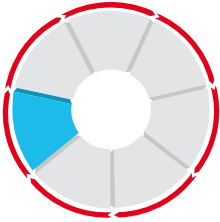
Software Applications

POWERCARD INTEGRATION

The PowerCard Integration software is capable of managing the whole production process, from data import to card mailing, supervising multiple production lines simultaneously and ensuring complete integrity of the production area in real time.

PowerCard Integration is the perfect application for production environments where a high throughput and a wide range of jobs are the norm.

The software allows;

- ❖ Flexible data import.
- ❖ Production line configuration. Production equipment can be in a parallel or in a row or in a Cluster layout.
- ❖ Split job in batches and sub-batches.
- ❖ Handle the batch picking-list.
- ❖ Monitor the ongoing production in real time.
- ❖ Manage the load/unload of card bodies, carriers and envelopes.
- ❖ Manage shipments and logistics by generating required documentation.
- ❖ Issue standard or personalized reports.

PowerCard Integration is also compatible with the *Pro Series and the Maxima series.*
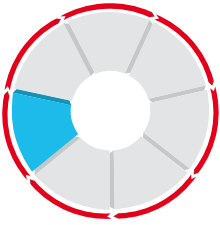
Software Applications

KMCS
KEY MANAGEMENT CRYPTO SYSTEM

The KMCS is an application that manages all the cryptographic operations and tasks required during the chip personalization process.

The KMCS is handling cryptographic operations related to the smart card personalization process. This includes - but not limited to – both encryption and decryption operations and PIN related operations. This software is also providing users with intuitive functions to manage issuer and chip related key sets.

The KMCS relies on a physically and logically protected cryptographic board. This security level ensures that neither keys nor sensitive data are in clear outside the HSM (hardware-protected tokens) thus protecting cardholder data and information during the complete issuance process. Thanks to key transfer protocols, all keys generated during the preparation phase can be securely and remotely transferred from one Hardware Security Module to another without any security breach.

Main features;

- ❖ Management of user profiles.
- ❖ Issuer management.
- ❖ Symmetric keys (DES) generation.
- ❖ Import/export of symmetric keys.

Architecture and technology;

- ❖ Windows PC server compliant (Windows 2003 Server).
- ❖ Remote access through TCP/IP network.
- ❖ Synchronous/asynchronous execution mode.
- ❖ Multithread execution for parallel processes execution.
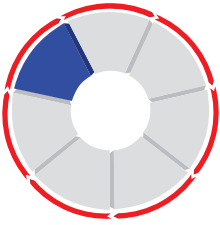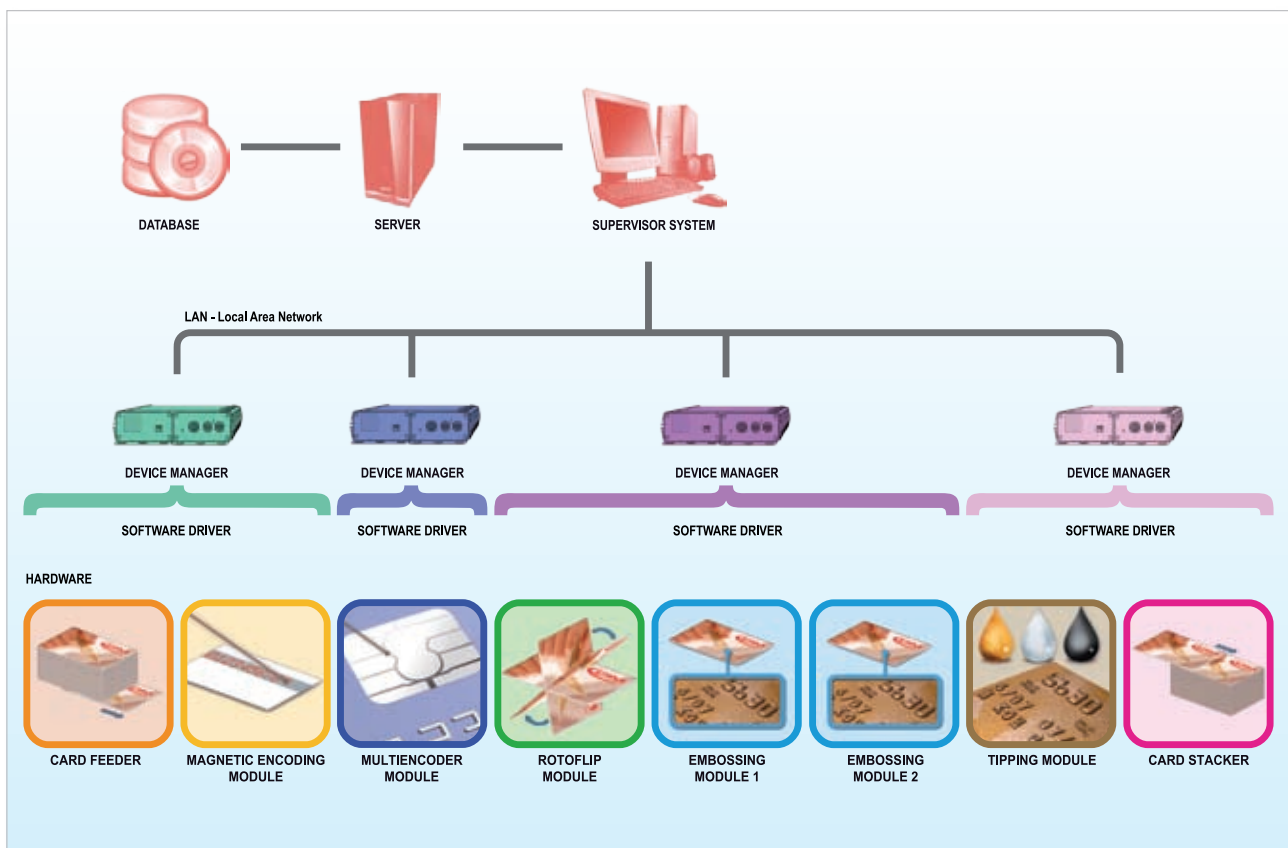
Recommended system requirements;

- ❖ Pentium IV 2,8GHz with 512Kb cache, 1GB RAM, 80Go Hard Disk.
- ❖ Windows Server 2003 with Service Pack 3 or higher.

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CARD IMAGING MASTER

PREMIUM SERIES

High Performance Card Personalization System – Engineered to Perfection

Flexible Solution - Configurations

LINEAR PROCESSING STATION - SINGLE LINE

DATABASE   SERVER   SUPERVISOR SYSTEM

LAN - Local Area Network

DEVICE MANAGER   DEVICE MANAGER   DEVICE MANAGER   DEVICE MANAGER

SOFTWARE DRIVER   SOFTWARE DRIVER   SOFTWARE DRIVER   SOFTWARE DRIVER

HARDWARE

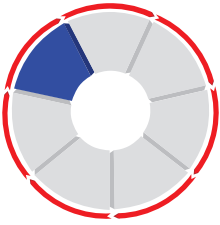| CARD FEEDER | MAGNETIC ENCODING MODULE | MULTIENCODER MODULE | ROTOFLIP MODULE | EMBOSSING MODULE 1 | EMBOSSING MODULE 2 | TIPPING MODULE | CARD STACKER |

CIM
CARD IMAGING MASTER

PREMIUM SERIES

High Performance Card Personalization System – Engineered to Perfection

Flexible Solution - Configurations

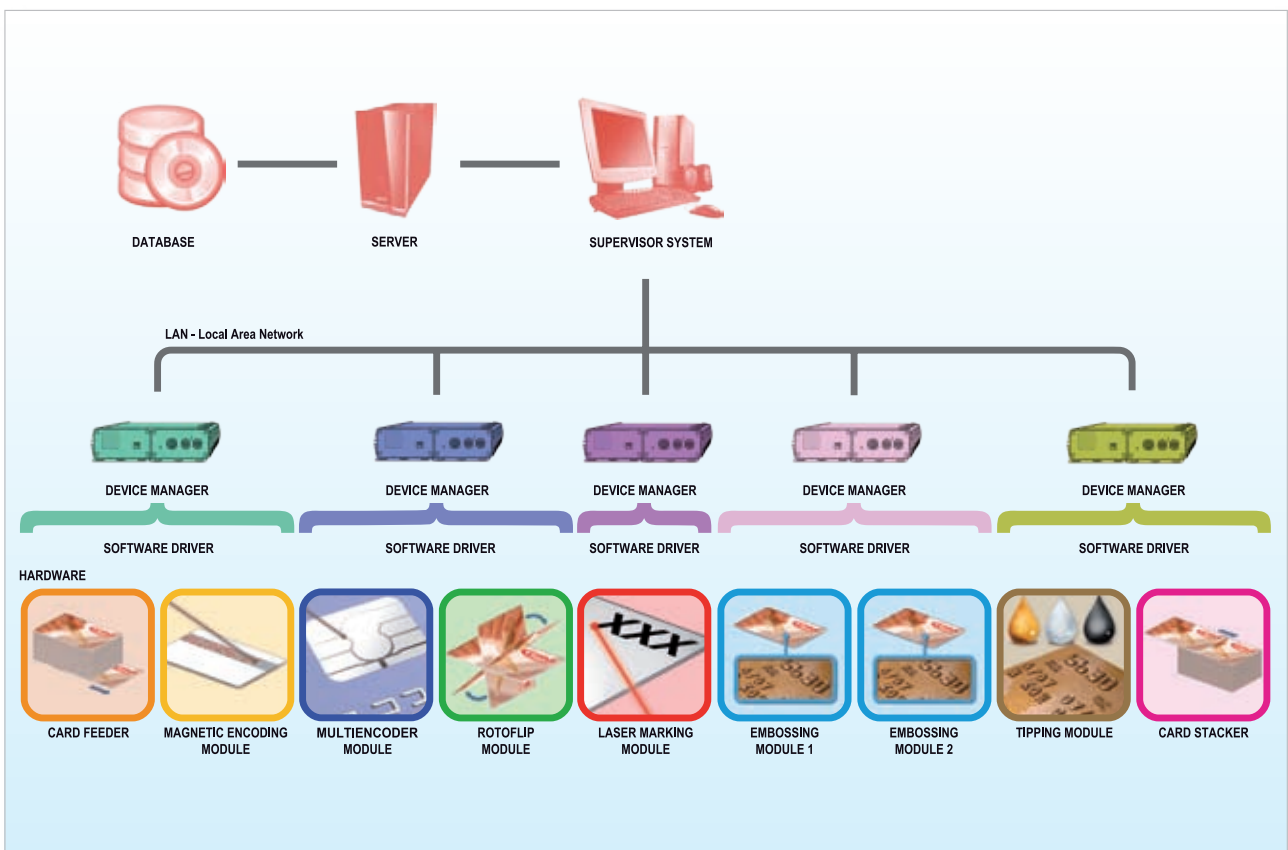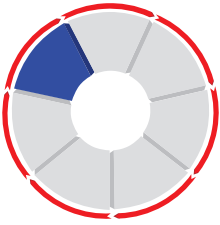## LINEAR PROCESSING STATION - SINGLE LINE

DATABASE   SERVER   SUPERVISOR SYSTEM

LAN - Local Area Network

DEVICE MANAGER   DEVICE MANAGER   DEVICE MANAGER   DEVICE MANAGER   DEVICE MANAGER

SOFTWARE DRIVER   SOFTWARE DRIVER   SOFTWARE DRIVER   SOFTWARE DRIVER   SOFTWARE DRIVER

HARDWARE

CARD FEEDER | MAGNETIC ENCODING MODULE | MULTIENCODER MODULE | ROTOFLIP MODULE | LASER MARKING MODULE | EMBOSSING MODULE 1 | EMBOSSING MODULE 2 | TIPPING MODULE | CARD STACKER

CIM CARD IMAGING MASTER

PREMIUM SERIES

High Performance Card Personalization System – Engineered to Perfection

Flexible Solution - Configurations

DOUBLE PRODUCTION LINE IN PARALLEL