



MULTOS Product Directory

Section 2

**Card Management & Personalization
Systems**

v8.00



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Card Management & Personalization Systems

ACI Worldwide

Bell ID

CardBase Technologies Ltd.

Cryptomathic Ltd.

Datacard Group

First Data Resources

NTT Data Corp

Oberthur Technologies

SmartCard Systems a.s.

SmartSoft Information Technologies

Thales e-security

TPS Pakistan

Trüb Switzerland



ACI Worldwide



Today, many card issuers and processors are moving to smart cards. Whether it is a replacement of the magnetic stripe credit and debit cards or the issuance of secure tokens and ID cards, smart cards can offer much more than the previous generation of cards.

The introduction of smart cards impacts almost every business aspect of a card issuer. The cards need to be replaced, the terminal infrastructure needs to be upgraded and the back-office systems need to be made smart card compliant.

A smart card can be made a living instrument in the hands of the cardholder. The lifecycle of the smart card and the individual applications that reside on it need to be managed, including post-issuance updates.

In all, many decisions have to be made before the first card can be issued. The costs and risks associated with a large-scale smart card rollout can be high. Most costs are found in the cards and the upgrading or replacement of the terminal infrastructure. The highest risks are in the implementation/migration project and issuance systems. Here, the right mix of products and experience in the smart card arena are essential for a successful rollout. ACI offers such a mix with mature products, extensive knowledge and experience, and a broad level of support to help card issuers migrate successfully to smart cards while minimizing risks and containing costs.

The ACI Smart Chip Manager™ Solution

ACI's offering for smart card management is based on the Smart Chip Manager product suite, which is built around a multiple issuer, multiple channel and multiple application smart card management system that manages the complete workflow within such a card scheme. The suite consists of products for smart card issuance and lifecycle management, application parameter management, card personalization and post-issuance.

Experience and Expertise

Every second, every day, more than 800 organisations around the world rely on ACI solutions to power online payment and smart card processing systems in both emerging and traditional channels. More customers use our software to manage higher payment volumes, of greater diversity, across more platforms and geographies, than any other provider in our field. In the emerging smart card market, ACI has become a major player by providing large-scale EMV and national smart ID card solutions, and participating in multi-application smart card projects in a variety of markets. Since 1975, ACI has provided software solutions to the world's innovators. We welcome the opportunity to do the same for you.

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Bell ID

bellid



Bell ID, a subsidiary of London-based Bell Group plc, has developed ANDiS®, its open software platform covering a complete spectrum of turnkey products and services for multi-application smart card management schemes. Based on ANDiS®, Bell ID markets the web-based Card and Application Management System (CMS/AMS) and the Key Management System (KMS). Key customers include Deutscher Sparkassen Verlag (German Savings Banks), ABN AMRO Bank, ING Bank, Macau SAR and the Dutch Ministries of Defence and of Justice.

The ANDiS® software suite has proven to be a reliable management system for handling the whole personalisation and post-issuance process in the highly secure environment of the MULTOS platform. The underlying application database – protected by an access control mechanism that could be even be extended to fingerprint recognition – is the place where eventually all the applications (ALUs, together with the Load / Delete certificates coming from the MULTOS KMA) are stored and distributed to the card when applicable.

This could be initial issuance – whether it is done in-house or at a third party personalisation bureau – including the interaction with the cardholder data and authorisation rules, or post-issuance, where the existing cardholder data is used to download specific parameters or applications onto the card through the Internet.

The visibility, or the download authorisation of the application(s), could even depend on the cardholder information stored within the ANDiS® system – like age, position, authority or else. The data is fully protected by the MULTOS operating system, and ANDiS® is able to generate unprotected, protected and confidential ALUs from the application data and the Issuer's keys.

The Key Management component enables securing and storing the necessary key information as well as managing the keys for devices, where applicable.

Last, the implementation of multiple card types is a natural fact for ANDiS® – as could be the case for dual issuing banks, for instance. By using the mechanism of Card Families, all the personalisation events are linked to a certain group of cards and from there the process can be fully automatic, up to sending the details to the personalisation equipment. The process itself can be designed to the specific needs of the card issuer by means of the process wizard – a unique workflow tool that has proven to be very efficient within a bank's changing environment.

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Card Management & Personalization Systems

CardBASE Technologies Ltd



MASCOT™

CardBASE Technologies Ltd designs, develops and delivers multi-application smart card management solutions and innovative payment and security applications, bringing increased profitability and service to businesses and organizations world-wide.

CardBASE MASCOT™ is a complete multi-application smart card management solution, essential for the control and management of complex multi-application smart card programs. The move from the traditional magnetic-stripe to smart cards has enabled the evolution from the solitary, payment only, option into customer relationship opportunities. The use of multi-application smart cards allows consumers to use the same card for a variety of services such as Payment (Debit/Credit, Purse), Promotions (Loyalty, compensation) and Security among others.

MASCOT is an integrated solution aimed at the customized bulk issuance, post issuance application update and lifecycle management of smart cards in a single or multi application environment. It also meets the needs of the low volume issuance market, often used initially for network or security access, before evolving into a full multi-application solution.

MASCOT has been designed as a Global Platform compliant Card Management System capable supporting multiple card platforms including MULTOS, Open Platform and generic card operating systems.

MASCOT is designed to handle single or multiple card issuers from within an individual administrative unit. This permits an organization, such as a bureau or platform operator, to issue cards on behalf of institutions, such as banks, loyalty scheme operators, universities et cetera, as well as allowing a single institution to manage and issue its' own cards. It provides the functionality to place the card, the applications and the cardholder details into the system and then collate these details for the purpose of card personalization, initial issuance, post issuance application update and subsequent card management - a total card lifecycle solution.

Features

- Ease of integration to existing systems
- Bulk personalization of multiple card types.
- Full card lifecycle support
- Management of multiple applications on a single card
- Interoperable with 3rd-party application providers such as EMV, CEPS, Loyalty and PKI.
- Complete card maintenance; e.g. hot listing, expiry, renewal, replacement or locking.
- Comprehensive Post Issuance application update and download facilities.
- Quick and simple procedures to replace lost or stolen cards.
- Expert reporting capabilities.
- Secure system access with data back-up and recovery procedures.

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CRYPTOMATHic Ltd.



CRYPTOMATHic

Cryptomathic provides specialist security solutions for businesses across the financial, government, digital rights management and smart card sectors. It is at the leading edge of security provision within its key markets and has been involved with smart cards since 1997. It counts a wealth of payment processing bureaus among its client list.

CardInk, Cryptomathic's second-generation EMV data preparation system, has been developed in close cooperation with major international financial institutions and service suppliers to meet market demands and smooth the migration path. CardInk ensures secure data generation and key management based on banks' record files.

The Cryptomathic CardInk system offers security, stability, and low maintenance and will suit almost any card strategy. It imposes no limitations on issuers supported, hence a high return on investment. A core objective of CardInk is the management of keys related to data preparation. All Internal Security Modules) guaranteeing secure import/export facilities.

CardInk supports a number of applications supporting the MULTOS and MULTOS step/one platform including: MasterCard, Visa and SPAN 2 amongst others.

Cryptomathic has extended the functionality of CardInk to support the recently launched MasterCard Integrated Card Application (MICA) on MULTOS cards. This development results in CardInk becoming the first commercially available data preparation solution capable of performing secure data preparation and key management for MICA MULTOS cards during card issuance.

Cryptomathic is also a leader in ID, e.g. ePassport, through a range of products including PKI and inspection systems.

Cryptomathic is also skilled in fast crypto implementations on a variety of specialized hardware platforms.

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Card Management & Personalization Systems

Datacard Group

DatacardGroup



Affina

The Datacard® Affina™ Platform Management Architecture is designed to help card issuers smoothly and profitably manage a multi-application smart card program.

Affina has been designed to deliver a total solution for multi-application management, enabling our clients to take a significant lead in this dynamic market within which card issuers of all kind are seeking new revenue streams and to grow and protect card bases by delivering enhanced value to the card holder.

A solution based on our core Affina software package provides real-time life cycle card management. Already in use across a many millions of cards, Affina enables the issuer to offer customers a selection of applications, both at time of initial card issuance and at anytime during the life cycle of the card. This dynamic post issuance functionality extends the reach of the card issuer and the value derived by their card holders, supporting card holder retention, card usage and brand maximization and protection.

Datacard uses core software and a range of services to help clients to design, develop, implement, operate and support a total solution configured to support their specific business needs.

Datacard's approach and market position enables us to effectively work with suppliers of complementary products and services, enabling the close integration of the final solution with the issuers IT environment.

Affina manages the entire life cycle of each smart card, from preparation and issuance to the tracking and maintenance of multiple applications. The Affina system automates the process of loading, deleting and changing applications, without needing to recall or replace the cards. Card issuers can load, block or delete applications at any time, and make new card-based services instantly available via the Internet or private network, or even over the air.

Affina keeps a complete record of every smart card issued, making it fast and simple to replace lost or stolen cards. This intelligence lets you build a powerful database containing valuable information about cardholders and application preferences. Both MULTOS™ and Java Card™ issuance are supported in addition to proprietary platforms.

Affina is also available as a total managed service. Datacard is already managing millions of cards under this scheme.

A multi-issuer option is also available, and provides the ability to host different card issuers (or partners) on a single Affina system, by using logical data separation of both configuration and cardholder data. (http://www.datacard.com/products/software/smart_card/affina.shtm)

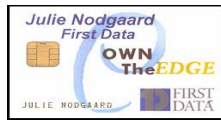
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First Data Resources



As the world's leading electronic commerce and payment services company, First Data is well positioned for growth in the new economy -- growth through expansion in its core markets, in adjacent new markets, on the Internet and internationally. First Data's smart card strategy is an excellent example of a strong growth opportunity. Our leadership in the card market will allow us to expand into supporting smart cards around the world.

Since 1997, First Data has been building an infrastructure to help us achieve our goal of providing end-to-end chip card enablement technology to our clients. The end-to-end solution includes card issuance, card acceptance, card holder information management, and customer service. Building off the strength of our existing core competencies within our card, merchant and payment businesses, First Data has the resources to offer card issuers chip card personalization, certificate authority and processing services.

First Data's team of smart card experts worked together to develop and implement a solution to personalize M/Chip and the Mondex electronic purse on the MULTOS card. First Data will be certified for personalization of these products by the fourth quarter of 2000.

In addition to providing smart cards service to domestic clients, First Data provides smart card processing services for more than eight clients in the United Kingdom representing 2.8 million smart cards on file. The company also provides smart card processing services in Australia.

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Card Management & Personalization Systems

NTT Data Corporation



NTT DATA introduces *Mulicpers*TM, the comprehensive pre-personalization package for smart card issuers. The smart card platforms to be supported include :

- MULTOS
- JavaCard (Open Platform)
- Smart Card for Windows

MULTOS is available from the first product release and other platforms may be supported after the details of their issuance scheme become available.

Mulicpers provides a comprehensive solution for the generation and management of MULTOS specific data. Its functionality covers the generation of various encryption keys and issuer associated information, as well as the management of MULTOS control data (MCD ID, MSM Controls Data, ALC etc).

Product Outline

Mulicpers retrieves the traditional processing data for magnetic striped cards , generates the additional M/CHIP select V2.01TM for MULTOS required data (encryption keys etc.) and generates them into MULTOS specific card data format suitable for loading on a card (ALU).

Main Features

- Easier Migration
Mulicpers enables the issuance of M/CHIP v2.01 Select for MULTOS cards with minimum impact on the traditional magnetic stripe based systems.
- System Flexibility
Mulicpers is designed to achieve maximum flexibility to meet issuer specific requirements, data generation / key generation / issuer information management / data management, generation of MULTOS specific card data (ALU), management of control data (raw cards / MSM Control Data / ALC etc.)
- System Interoperability
UNIX based system provides wide interoperability.
Native Support for Smartcard Credit Applications
 - M/CHIP Select V2.01TM for MULTOS (from MasterCard International)
 - JCB smartcard credit application
- Consultation Support
NTT DATA provides consultation support to issuers for the parameter configurations.

Mulicpers is trademark of NTT DATA Corporation

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Oberthur Technologies



Oberthur Technologies (Paris Stock Exchange SICOVAM 12413) is a global leader and an innovator in the smart card industry - providing advanced card-based solutions for a wide range of sectors. We are the world's N°1 supplier of MasterCard and Visa cards, N°1 in banking, e-commerce & m-commerce and pay-TV, Oberthur is also a leader in multi-application and GSM technologies. Firmly committed to open standards, Oberthur backs MULTOS and offers a wide range of MULTOS-based applications and cards, all of which can be managed by its personalisation centres and its advanced Card Management System.

Oberthur's Card Management System

As multi-application smart cards become sophisticated and as more applications become available, a system of secure card management is required. Complete new sets of information, such as card profile, application status and security policy need to be defined and made available to different parties before card issuance. Input and output from all new processes also needs to be traced to manage the life cycle of the card. Oberthur Technologies has developed a Card Management System to manage all of these elements – and thanks to Oberthur's heritage in card manufacturing – the system delivers a complete end-to-end card management service.

Oberthur's Card Management System:

- Manages all data necessary to issue and re-issue smart cards
- Ensures the coherence of data
- Stores the business specifications defined by the issuer and/or the service provider
- Manages application distribution both at the card issuance and post issuance stage – including application download, update and deletion.

The system applies to any MULTOS-based cards or applications.

Personalisation:

Oberthur profits from an impressive production infrastructure and a wide network of personalisation centres complying with the strict security procedures for the loading of MULTOS applications. Oberthur also offers a complete service of personalisation for Mondex applications.

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Smart Card Systems a.s.

MultimaCarta

Smart Card Systems a.s is a provider of multi-application smart card technology and services. Based and registered in Oslo, Norway the company specialises in e-commerce solutions, smart card related system integration, and especially card management and issuing systems for MULTOS cards. Smart Card Systems a.s is 90.1% owned by Hitachi.

MultimaCarta

In co-operation with Hitachi Europe Ltd., Smart Card Systems a.s offers a comprehensive Card Management System for MULTOS cards. The software package, MultimaCarta™, includes the following modules:

- **Card Production Module:-** Using high volume readers, the system allows automation of all MULTOS processes, registration, enabling of cards, loading and the deleting of MULTOS applications on cards.
- **Issuing and Personalization:-** Issuing of cards, including automatic registration of chip ID, card ID and card holder ID. Interfaces to MULTOS applications' back-office systems for application personalization. High volume printing of cards. Includes a card holder's database with photo/signature/text/bar code/magstripe information and software to capture pictures and signatures. MultimaCarta is also a suitable tool for the implementation of local issuing systems using inexpensive desktop card printers.
- **Card Management:-** Record the card's profile at every system change. Allows problem forecasting and analysis: applications, versions, chip ID, card ID, spare capacity, etc. Internet communication to and from Local Issuing Stations and MULTOS applications like Mondex™, Electronic ID, Interactive Loyalty™, Credit, Debit, etc.
- **Remote Operations:-** Make the loading and deletion on MULTOS cards possible in remote terminals and PCs, over Internet or Intranet. Records the use of terminals, where applications have been loaded and deleted, and record terminals with problems.

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SmartSoft Information Technologies



About SmartSoft

SmartSoft is the leading developer of evolutionary solutions about smart card technologies. Having a wide knowledge and experience on smart cards and EMV technology, SmartSoft offers secure, flexible and modular solutions for its customers.

SmartSoft has a wide experience in smart card technology, ranging from card personalization systems to payment systems, from terminal applications to web based applications. SmartSoft has built a reputation as a provider of end-to-end solutions about EMV for issuing and acquiring companies.

The working areas of SmartSoft are smart card technologies, banking, government and local area smart card based applications; and PKI, E-Commerce and Security applications.

Smartsoft developed EMV Level 2 Terminal Software and received Type Approval from EMVCo.

SmartSoft is offering to banks and financial companies end-to-end solutions for EMV Migration. SmartSoft offerings include also system integration, consultancy and training.

Using its wide EMV experience, SmartSoft developed EMVAnalyzer tool. This tool was developed based on a Level 2 certified EMV Application, so it is completely compatible to EMV Standard. EMVAnalyzer can test MULTOS cards , so giving the user opportunity of seeing all information on MULTOS card.

The main purpose of EMVAnalyzer is to bring all EMV transaction details to user. It is very difficult to completely cover all EMV topics for people who will develop their systems for EMV migration. This tool facilitates EMV learning, testing and understanding.

The main features of EMVAnalyzer:

- A real EMV transaction on PC performed
- Seeing all EMV transaction details
- Seeing the commands between card and terminal
- Seeing the values of EMV data elements
- Issuer Script generation
- Terminal simulation. All terminal parameters can be configured from screens.
- Issuer Authorization Host simulation
- Special commands can be sent to card to get internal parameters of the card
- EMV Data Element Searching Machine
- Online connection to authorization systems of issuers
- Defining the format of online messages

Another tool of SmartSoft, SinglePerso is a PC-based EMV card personalization tool. All EMV data elements are entered from easy-understandable screens to prepare EMV data. The screens show all details about all EMV data elements. Cryptographic data elements such as digital signatures and certificates are produced. After completing the entrance of all EMV data, user inserts into the reader a blank EMV card, presses the PERSONALIZE button, and EMV card is personalized. SinglePerso, has ability of personalizing also MULTOS cards. The main features of SinglePerso :

- From PC, EMV card personalization ability
- Profile management
- Defining the file structure of the card
- Personalization log
- Seeing all commands interchanging between card and terminal in personalization

SmartSoft is continuing to develop MULTOS based applications to offer its customers cost-effective, reliable, secure and flexible solutions.

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Thales e-Security

THALES

Thales e-Security (formerly Zaxus a Racal company,) has worked closely with the card associations and card issuers world-wide to develop a Personalisation Preparation Process (P3) product for the implementation of smart card trials and full programme roll out. During this development the group has established strategic relationships with smart card manufacturers, application developers, personalisers and card management system providers.

The P3 system generates MULTOS Application Load Units (ALU) and customisation data for any application(s). P3 supports multiple applications, card and scheme key management, card and data record processing, plus audit and event management.

P3 handles the data needed to run personalised applications from any source, in-house development, directly from software vendors, from payment associations and the data requirements of non-financial applications. P3 provides the option to upgrade or add new applications to the cards when necessary without having to re-design the system.

Thales e-Security has produced an easy method for card issuers, both financial and non-financial, to build a framework to provide personalised services to card issuers and holders. P3 is becoming the de-facto standard for the creation of application data in smart card technology.

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TPS Pakistan (Pvt) Ltd



TPS Overview and Achievements

TPS is one of the leading solution providers of e-banking and e-payments solutions, specializing in card-based personalization software solutions with over 200+ successful projects across 25 countries worldwide. TPS offer competitive advantages through flexibility, value and innovation.

Solution Features:

TPS has developed unique market leading software solutions to make it easier and cost effective for our customers to attain EMV compliance. TPS' EMV Personalization Solution, Sentinel is capable of handling multiple card schemes and applications. A company can either launch new EMV cards or migrate their existing magnetic stripe based multiple products to EMV cards. Following are the main features of Sentinel

- Issuer Portfolio Management
 1. Multiple Chip Application Support
 2. Multiple product support
- Support for Disparate Card Applications (EMV Payment Applications, Loyalty, E-Purse, Custom Applications)
- Card Life Cycle Management
- Bureau Service Facilities
- Support for different platforms with adherence to standards like (Global Platform, MULTOS, Java Card)
- Web Based User Interface
- In-dept reporting provided at each stage ranging from audit reports, production reports to validation reports
- Enhanced security with adherence to EMV, MULTOS, Java Card & Global Platform Security requirements, smart card based user management and hardware based cryptographic computation
- Support for Card machines from multiple vendors
- Support for HSMs from different vendors
- Support of Post Issuance Personalization

Solution Benefits

Sentinel is a turnkey solution for personalization of Applications on Chip like VSDC, MCHIP and different Loyalty applications. Sentinel can take magnetic strip data from sources such as the banking hosts or existing magnetic-stripe based card personalization system; perform data conversion on this data and can prepare EMV data as required. The data generated can then be personalized on the cards during card production process.

Sentinel takes full care of all the steps involved in the personalization of an application over MULTOS platform beginning from choosing between the different templates of the EMV applications to physically personalizing the customer's data on the card. Sentinel also helps customers to get the best suited functionality of the application by choosing the appropriate values for generic fields of the Chip Applications.

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Card Management & Personalization Systems

Trüb Switzerland

TrackStar® CPS



TrackStar®

The total factory management solution for personalization service providers

TrackStar® is a mature and proven workflow management system for personalization centers suited for the issuing of high security documents such as ID cards, driver licenses and passports as well as complex chip cards in various market segments such as banking, PKI and access cards.

TrackStar® is a modular, scalable and easily extendible data management system that organizes the document personalization process from data import to personalization to quality check to packing and delivery.

The software is modular, scalable and easily extendible. The whole personalization process is governed by the compact workflow system – from data import to personalization to quality check to packing and delivery.

Key Benefits:

- Proven Solution
TrackStar® was developed by Trüb AG based on over thirty years of experience in personalizing documents. This system is currently running at over a dozen installations worldwide processing more than 40 Mio documents per year.
- TrackStar® unlimited
Full support for today's and future market requirements for highly individualized and complex document personalization as well as secure data processing
- Fast project implementation
Standardized modules and packages allow project implementation as fast as 10-15 days – including on-site installation and operator training!
- Non-Proprietary
Open interfaces enable the integration of a multitude of machine suppliers and chip solutions.

Added Value Aspects:

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MULTOS is a trademark of Ltd.



- Ready for EMV or similar certification
Corresponds with the stringent EMV requirements concerning data security, data processing and data privacy.
- Compliance with ICAO Doc 9303
Passports and eIDs are produced according to the latest ICAO recommendations including the programming of the integrated secure RFID chip.
- Flexible operational area
TrackStar® can be used for centralized personalization centers with high volumes and for small decentralized personalization.
- Easily configurable - optimal result
Modules and packages can easily be adapted by online configurations to various customer requirements. A short return on investment is guaranteed.
- Grows as you go
The modular and scalable structure of TrackStar® allows adding functions if required. A large variety of modules and packages are available.

TrackStar® is used wherever performance, traceability of highly important and sensitive data and ease of use are required.

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