



SEQUOIA MOSAIC 3000: ELECTRONIC PAYMENT SYSTEM (AUTHORIZATION FRONT-END)

Functional description

User's manual

Version 2.0

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1.1. Purpose of the document

This document describes the functionality of the SM 3000 Electronic payment system, SM 3000 on-line authorization core system, and its place in the SM3000 processing solutions. This document was prepared for users of the SM 3000 EPS.

1.2. How to use this manual

The manual is designed to show the main functions of the Platform and to give a short description of the SM3000 EPS for users.

The terms, abbreviations and useful references to other documents about the SM 3000 system are provided at the final part of the document.

Terms and Abbreviations - a glossary of terms commonly used in the card processing and electronic funds transfer industry.



To know how to use the ALFEBA documentation, to find information about the register structure and graphic tags, used in the documentation, see the Manual 200100 «Documents register».

1.3. Classification

This document has been classified as External.

1.4. Document sheet

200001

1.5. Document contacts

In the case of questions or proposals about information presented in this document, you can contact Alfeba's Documentation Division by email doc@alfeba.com, by phone +598 2 208 31 42 or by mail, using the address: Av. Agraciada 2770, Montevideo, 11823, Uruguay.

1.6. Document history

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2.1. General information

In this chapter we provide the principal information about SM3000 EPS of the Sequoia Mosaic 3000.

2.2. About SM3000 EPS

SM 3000 EPS is a front-end system built on a modular principle, which allows you to choose all the necessary functionality and at the same time optimize the cost of its acquisition.

SM 3000 EPS is the industrial processing solution among the banks and processing companies, leading in terms of fault tolerance, scalability and openness. From the point of view of fault tolerance, the system was designed and implemented with an emphasis on the highest possible requirements, after initial installation, it practically does not require maintenance and has been operating for many customers for more than 15 years without a single critical failure. The scalability of the system is, without exaggeration, a record. SM 3000 EPS runs the POS terminal networks and ATMs networks. In a laboratory environment, the rate of 500 transactions per second is reached, so your investment in SM 3000 EPS will never be lost, as it will satisfy your processing needs, no matter how they grow. From the point of view of openness, the system comes with complete documentation and source codes for everything except the communication core. ALFEBA policy does not prohibit making modifications and improvements, either on its own or by third parties that are present in sufficient quantities on the market. According to our information, this offer is unique for our market.

SM 3000 EPS supports all modern protocols for working with international payment systems, provides unique flexibility in setting up the inter-post exchange interface based on the ISO8583 standard and, due to its prevalence, has the widest range of supported card service devices.

2.3. SM3000 EPS functionality

- SM 3000 EPS supports a network of ATM devices that are compatible with the NDC +, Diebold or ISO 8583 protocol.
- SM 3000 EPS supports the connection of any POS terminals that support the open and documented ISO 8583 protocol, which is now widespread, implemented by almost all major device vendors and is well described for independent development in the field of POS device emulation on cash registers and other systems based on personal computers.
- Acceptance of transactions from any sources connected using the above protocols is provided, including systems serving Internet commerce sites, independent networks of large outlets.
- It is possible to send requests using standard protocols to external systems to provide various payment services at ATMs and self-service terminals [SST] or e-commerce.
- Acquiring transactions are supported both for the internal network and for external international payment systems, including VISA products, MasterCard local networks, etc.

- In addition to automated authorizations on devices, voice authorization is supported, including with entering the CVV2 / CVC2 code.
- Issuer's traffic is authorized based on PIN, CVV / CVC checks, limits, current balances and blocking facts. Stand-in mode is also supported.
- The system has the functionality of forwarding (switching and routing) transaction flows from various sources to external interfaces, including international payment systems and local networks.
- xPays issuing and acquiring support.
- Fraud prevention support.
- e-commerce with 3DES support.
- Virtual cards issuing and acquiring support.

2.4. Modern cards industry requirements cover

The SM3000 EPS is developed to cover the needs of:

- A. Third party processors/ Member service providers of Visa, MasterCard and other international and national payment systems;
- B. Banks - members of MasterCard, VISA and other international and national payment systems;
- C. Payment operators and facilitators;
- D. Agents of payment operators and facilitators (independent sales organizations [ISO])
- E. Internet merchants and their subsidiaries;
- F. Cardholders and bills payers.

2.5. SM3000 EPS structural parts

The SM3000 EPS has three main internal structural parts:

1. CORAL - network jobs core;
2. Modular applications (ATM interface, POS interface etc.);
3. APIs and H-T-H interfaces.



To learn more about parts see sec. 3.3. The platform architecture.

2.6. SM3000 EPS integrations

Developed from the national processing center solution SM3000 EPS has traditionally a wide possibilities of the integration both with internal and external applications:

Internal ones:

- SM3000 IAP,
- SM3000 PAYMENTS,
- SM3000 PERSONALIZATION,
- SM3000 CRYPTO,
- SM3000 RISK.

External ones:

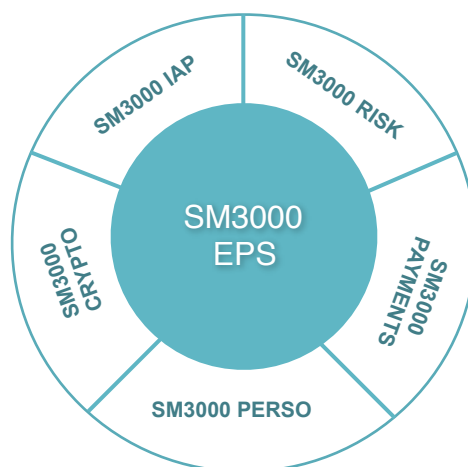
- External authorization processing cores (SWITCHs): Way4, SmartVista, TransactPro, Compas+, Base24.
- E-commerce platforms: CyberSpace.
- Banking accounting systems (banking cores): BankXXI Century, TEMENOS.

2.7. The place of SM3000 EPS in the SM3000 processing solutions

SM3000 EPS is a switch and authorization core solution, which can be implemented with external authorization processing platforms and accounting systems.

The place of the SM3000 EPS you can find in the Picture 2.7.0.0.

Picture 2.7.0.0. SM3000 processing solutions structure



- SM3000 EPS** - is a on-line authorization processing core, developed for the Third party processors, national processing centers and banks - members of payment systems MasterCard, VISA and others. The Core processes cards issuing and acquiring banking programs, ATMs and POSs networks, has direct gateways to VISA, MasterCard and other processing systems. The full functional description of the SM3000 EPS see in the Manual SM3000 EPS. Functional description. The Core has integrations with core banking systems, TEMENOS, BANKXXI, DIASOFT and others banking accounting solutions.
- SM3000 PERSO** - is a personalization platform for the DataCard and NBS personalization stations. It supports NFC-based, contact chip and magstripe products personalization jobs. The full functional description of the SM3000 PERSO see in the Manual SM3000 EPS. Functional description.
- SM3000 RISK** - is a core based fraud prevention platform for the issuing and acquiring cards programs, based both on
- host parameters filters and
 - on-line decisions making based on transactions history.
- The full functional description of the SM3000 RISK see in the Manual SM3000 RISK. Functional description.
- SM3000 PAYMENTS** - is a platform for consumer credits, on-line payments for credit, MO/TO transactions by credit, membership programs, bonus and discounts management for cardholders and merchants. The full functional description of the SM3000 PAYMENTS see in the Manual SM3000 PAYMENTS. Functional description.
- SM3000 IAP** - is a e-commerce solution that enables you to manage the payment transactions of your business. The platform supports multiple payment methods and integration methods.
- SM3000 CRYPTO** - is a full platform for the crypto currencies issuing and acquiring, including Merchant profile and mobile applications for users, crypto change offices and crypto stock exchange software, on the government and private level of the implementation. The full functional description of the SM3000 CRYPTO see in the Manual SM3000 CRYPTO. Functional description.

Between the mentioned platforms of the SM3000 processing solutions are local products, like a software for POS terminals (NEW POS and others), self-service terminals etc. Functional description of these products can be provided on demand.

Chapter 3. Platform architecture

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3.1. General information

In this chapter we describe a structure of the Sequoia Mosaic 3000 EPS.

3.2. The platform architecture

The core of the SM 3000 EPS is a CORAL system, which provides the communication layer, delivers messages, and also serves as the basis for the operation of other products.

Among the key properties of the CORAL system, we note the following:

- Guaranteed and reliable message delivery;
- Excellent communication capabilities in terms of a wide range of supported communication protocols;
- Advanced functions of network management and routing;
- Monitoring of the work process and dynamic load balancing;
- Context-independent processing to support a wide range of devices, communications and applications
- Complete information on event management and statistics;
- Architecture that supports linear extensibility;
- Open platform for future applications for transferring transactions, files and messages;
- Fault tolerance, which makes it optional to add resiliency software to the code of applications and other products.

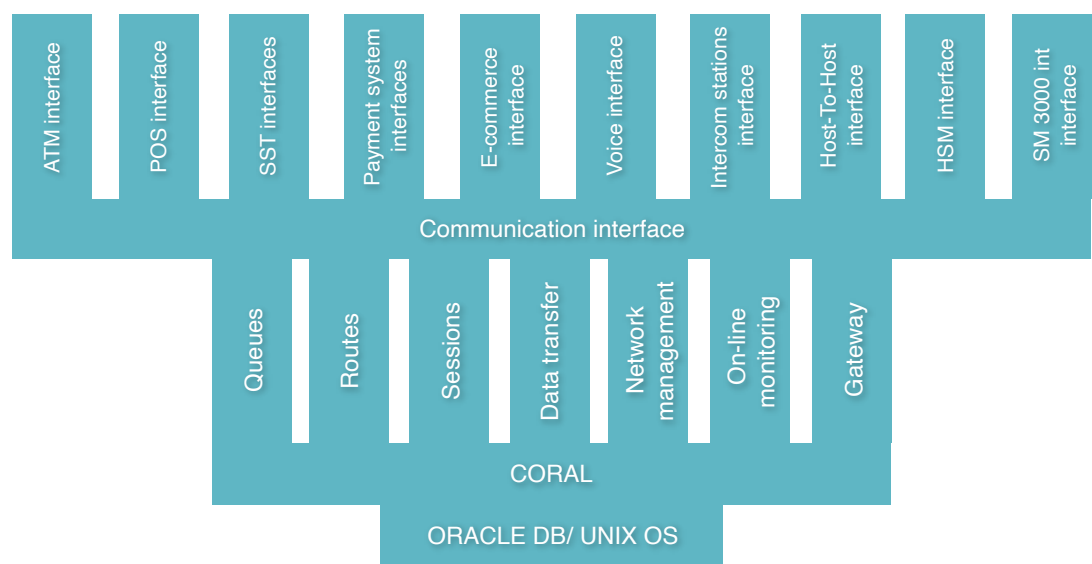
The inherent non-stop operation of the CORAL ensures maximum fault tolerance for all other SM3000 products. While also providing centralized control, the CORAL system provides complete data protection and ensures that transactions are never lost and data integrity is not compromised, even during peak periods and during system failures.

The advanced communication technology of the CORAL system underlies a wide range of capabilities to support various networks, devices, nodes and types of exchange equipment. This ensures any-to-any connectivity, which in turn opens up many possibilities for integrating existing and future systems and networks and ensures that the SM3000 will work well in any modern network infrastructure.

In addition to excellent communication layer capabilities, CORAL also provides a platform for a wide range of EFT tasks. CORAL interfaces with many other electronic applications, including POS terminals, ATMs, teller terminals, postal services, telephone banking and clearing devices. SM3000 EPS supports also Cash management and other banking applications.

The general scheme of the SM3000 EPS is presented in the Picture 3.2.0.0.

Picture 3.2.0.1. SM3000 EPS scheme



3.3. Encryption standards

ALFEBA uses the encryption standards for the SM3000 EPS, presented in the Table 3.3.0.0.

Table 3.3.0.0. The SM3000 IAP encryption standards

Purpose	Encryption algorithm
User browser interaction	TLS 1.2 or above
Message signature	HMAC with SHA-256
Database data encryption	AES with 256 bits key size, 3DES, RSA

Chapter 4. CORAL description

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4.1. General information

In this chapter we describe the main functions of the CORAL of SM3000 EPS.

CORAL is a message-oriented middleware with a number of capabilities, including network connection switching, message switching, data transfer and safe storage. In addition to its core functions, CORAL is also a development platform for other SM3000 products, including ATMs, POSs, SST (branch automation) and Telebanking.

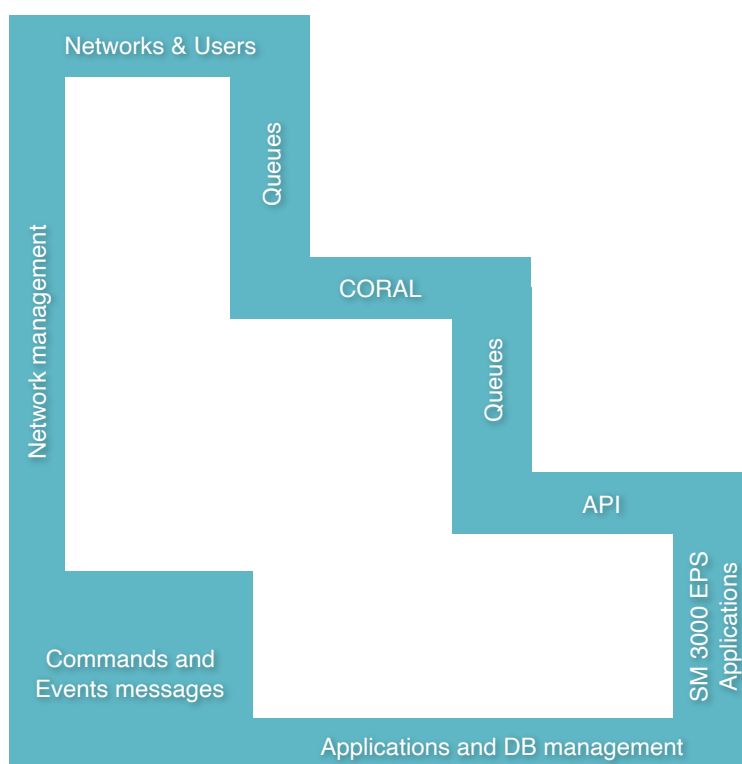
As networks grow in size, with more transactions and more users, efficient and accurate network operation becomes a key factor in ensuring the proper level of functionality and operating costs, both in terms of personnel and hardware required.

In addition, network providers must ensure that they make the most of their available software to achieve optimal transaction performance at the lowest cost.

CORAL addresses these issues by providing powerful and flexible tools to enable automated operations coupled with real-time system monitoring tools.

The common CORAL structure of the SM3000 EPS is presented in the Picture 4.1.0.0.

Picture 4.1.0.0. The CORAL global structure



4.2. Peak loads and congestion management

CORAL and other SM 3000 applications are designed to cope with planned peaks in transaction loads when properly configured. This ensures that systems are not overloaded to the extent that it could affect the quality of service provided to customers.

However, as networks grow in size and transaction volumes increase, it is not always possible to eliminate unexpected peaks in transaction volumes that may exceed planned volumes. It is very important that any system be able to handle such 'spikes'.

CORAL takes care of handling peaks of transactions 'delicately' without compromising the integrity of the system. Applications are informed that their queues are growing so that appropriate action can be taken to avoid congestion at the application level.

4.3. On-line monitoring

We developed SM 3000 EPS to make easy to implement On-line monitoring tools as ZABBIX and other similar products, that provides the operator with a real-time view of system performance. It can display a chart, and numerical information about the performance of transactions in any selected part of the system. It can be used to control the most bandwidth sensitive points on the network, such as interfaces to hosts or connections to third parties.

Operators can set performance thresholds (for example, 80% of the channel bandwidth), above which a corresponding warning will be issued. This ensures that the necessary measures are taken before problems escalate and more serious intervention is needed.

Thus, the SM 3000 EPS provides unprecedented capabilities to support a variety of application networks and performance.

Chapter 5. SM 3000 EPS overview

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5.1. General information

In this chapter we describe the main functions of the SM3000 EPS.

The SM3000 EPS handles all tasks related to routing, switching and authorization of transactions. It relies on the CORAL approach, which enables SM3000 EPS to realize all the advanced networking capabilities provided by CORAL architecture.

A key quality of SM3000 EPS is its modular structure, which allows it to meet the requirements of a variety of customers from the smallest EFT networks to the most powerful authorization and switching networks. SM3000 EPS is a modern and widespread EFT transaction processing product.

SM3000 EPS is the result of many years of close collaboration between ALFEBA's companies and our customers. SM3000 EPS was proposed by ALFEBA and was designed to take full advantage of the hardware or cloud technologies, namely:

- Fault tolerance;
- Parallel processing in non-stop mode;
- Modular and linear expansion;
- Extensive networking capabilities;
- Excellent price / performance ratio;
- High levels of security;
- Distributed processing;
- Data integrity.

SM3000 EPS is a product designed for fast, efficient and secure electronic transactions. The product is capable of supporting many different configurations (such as Issuer, cardholder, Front-end system, Switch, etc.) and many different functions, and comes as a set of integrated application modules.

Along with the secure processing of electronic payments, SM3000 EPS has excellent performance in supporting the following features:

- Authorization;
- Commutation;
- Device management;
- Drafting and reconciling invoices.

The SM3000 EPS system is divided into modules that perform the following functions:

- Numerous functions related to transactions and authorization;
- Full support for POS terminals and ATMs;
- Standard online interfaces with other authorization networks;
- Securing messages, personal identification numbers, and key generators;
- Reporting and Queries, Including SQL Query Utilities;
- Flexible data management including retrieval and update;
- Convenient and complete user, system and screen access.

SM3000 EPS is a multifunctional modular product. For ease of understanding, the functions of each module are described below and how they interact to meet the requirements of a typical system.

5.2. Authorizations

An alternative authorization mechanism should be provided for host busy periods such as a daily burst cycle. When using SM3000 EPS to authorize a transaction, accurate information is always available. This gives an additional level of reliability and functionality to the system. The SM3000 EPS product supports flexible authorization modes for all kinds of issued cards. Where the authorization is directed depends on many user-configurable factors, including the card prefix (eg BIN), account type (eg current, deposit), and card type (eg Debit, Credit, VIP). Accordingly, authorization and routing parameters can be set that define a variety of authorization paths for multiple accounts and account types. Combined with support for user numbers, processing rules can be defined for one or more cards to allow access to multiple accounts and authorization paths. This flexibility makes it easier to work with distributed databases, optional internal processing, and alternative routing in case the authorization destination is not available.

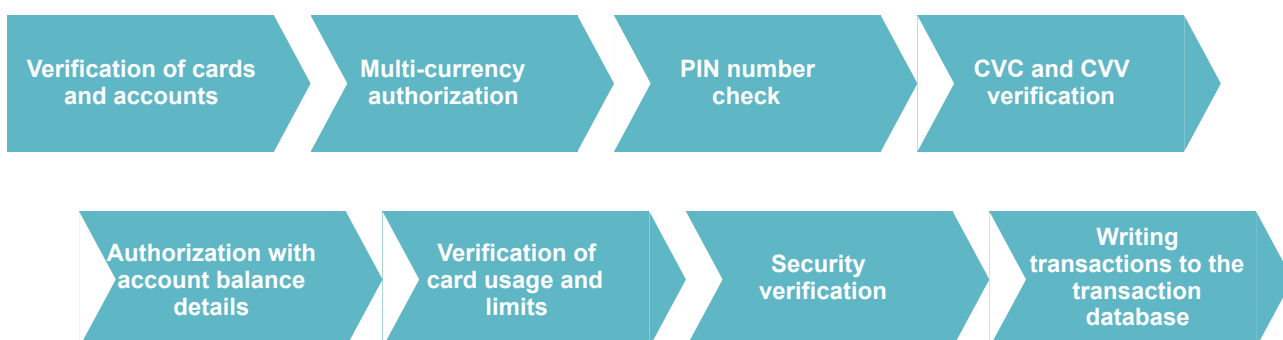
In addition, SM3000 EPS can provide gateway services with other authorization networks such as AMEX, MasterCard, VISA, etc.

The SM3000 EPS system authorizes transactions according to the issuer, card number range or individual card authorization parameters, and registers the transactions in the appropriate database, from where they can subsequently be retrieved for sending to the host or card issuer and used as input for specific processing programs on host computer or on the card issuer's system. Authorization can be performed regardless of whether the message is an ATM or POS transaction.

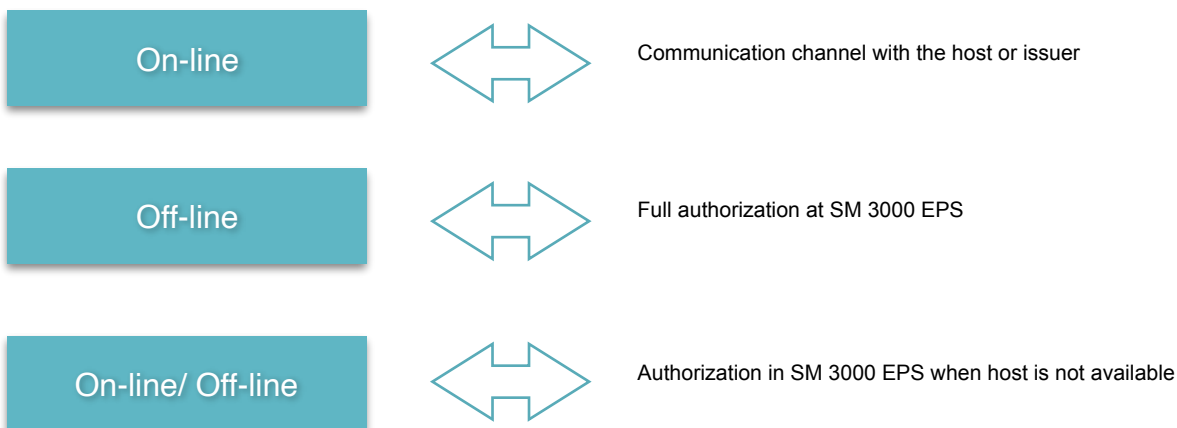
Authorization files are common across a suite of products. Each entry stores the full authorization parameters and limits as general, and specific authorization parameters and limits for each product, thus providing the flexibility necessary to set the authorization parameters for each individual product.

The authorization process in SM3000 EPS can perform the functions, mentioned on the Picture 5.2.0.0.

Picture 5.2.0.0. The authorization process functions



SM3000 EPS includes a number of levels of authorization, including:



All or any combination of these options can be selected in the configuration.

SM 3000 EPS also includes a number of authorization methods, including:

- Negative (including VIP and card status authorization);
- Negative using limit data;
- Positive;
- Positive with balance;
- Default.

All of the above options can be performed on SM 3000 EPS, which is separate from other systems, or in stand-in option if the issuer is not available. SM 3000 EPS also supports preliminary verification of transactions before they are sent to the issuer. These checks can include expiration date, card status, PIN number, and limit checks. If SM 3000 EPS authorizes the transaction during normal or stand-in processing, then the completion of the transaction can be sent to the host.

Positive authorization is usually offered using card and account information. Primary, secondary and stand-in processing limits can be configured so that issuers can allow the proposed system to authorize transactions for them. As with any SM 3000 EPS authorization options, this one can be configured by the user this way and when necessary due to changing authorization requirements.

When using the positive authorization option, SM 3000 EPS makes one database entry for each card and up to ten entries for each account that can be accessed through that card.

5.3. Merchant authorization

In addition to authorization based on cardholder verification, SM 3000 EPS contains powerful merchant assessment and authorization functions to minimize merchant fraud, using HOST parameters.

Information about the merchant is centrally stored in SM 3000 EPS and is used to evaluate all transactions. Merchant limits can be set for the type of transaction (i.e. purchase, return), product (type of card, debit, credit) and transaction quantities.

SM 3000 EPS automatically checks if the merchant has the right to carry out the transaction and can decide if the transaction falls within the expected cost boundaries.

5.4. POS transactions

SM 3000 EPS supports a wide range of EFT transactions for POS terminals, made by NFC, contact or mag stripe cards or by QR-code, including crypto currencies wallets, including:

- Regular sale (debit and credit);
- Credit sale with installments;
- Credit sale with installments and Equifax clearing on-line check;
- Cancelation;
- Purchase with pre-authorization and subsequent confirmation;
- Bills payments;
- Credit payments (installments);
- Card verification;
- Cash withdrawal;
- Cash deposit;
- Gift card charge;
- Purchase returns;
- Account balance request;
- Reports;
- Bonus program support (payments by bonus point, bonus points accumulation, bonus points balance check);
- Crypto currencies sell and buy operations;
- Summing up the balance at the terminal, including summing up the balance for a specific batch of transactions, for a shift, for a clerk, at the end of the working day.

5.5. ATM transactions

SM 3000 EPS supports a wide range of EFT transactions for POS terminals, made by NFC, contact or mag stripe cards or by QR-code, including crypto currencies wallets, including:

- Deposit;
- Cash withdrawal;
- Cancellation;
- Payments, including to mobile phone vendors;
- Inquiries;
- Money transfers;
- Cash withdrawal by credit card;
- Message to the institution;
- Fast Cash;
- Write-only transactions;
- Statements print transactions;
- PIN change transactions;
- Currencies exchange operations;
- Crypto currencies sell and buy operations.

The authorization and transaction processing functions supported by SM 3000 EPS form a powerful and flexible tool for managing transactions and preventing fraud by cardholders and merchants. The SM 3000 EPS system will confidently meet today's requirements and provide a solid foundation for future development.

5.6. E-commerce transactions

SM 3000 EPS supports a wide range of EFT transactions for the e-commerce industry, made by NFC, contact or mag stripe cards or by QR-code, including crypto currencies wallets, including the next messages support:

- Amount hold request message;
- Charge request message;
- Single message;
- Recurrent payment message;
- Hold cancelation request message;
- Reversal request message;
- Refund request message;

- Cancellation request message;
- Operation status check request message;
- Card credit possibility check request message for p2p;
- Card debit request message for p2p;
- Card credit request message for p2p;
- Recurrent charge request message for p2p;



To learn more about transactions management see Manual 200101 «SM3000: IAP. Functional description».

5.7. Self-service terminals [SST] transactions

SM 3000 EPS supports a wide range of EFT transactions for SST terminals, made by NFC, contact or mag stripe cards or by QR-code, including crypto currencies wallets.

The list of the transactions is the same one as for POS terminals, made without cashier.

5.8. ATMs and POSs support

We have extensive experience in delivering software products that support all major types and models available from POS terminal and ATM vendors. Through relationships with our strategic partners, we can ensure that all products related to specific device services are supported at a level consistent with the technology and capabilities of the device vendors.

SM 3000 EPS device support functionality includes the following:

- Extensive transaction support including undo;
- Terminal request for confirmation of connection;
- Terminal key management;
- Terminal connection / disconnection;
- Loading parameters into the terminal;
- Day close on the terminal;
- other functions.

The number and types of devices supported by the standard SM 3000 EPS system is the largest of all solutions, and the list of supported vendors includes:

- Verifone;
- Ingenico;
- NewPOS;
- IBM;

- Bull;
- NCR (NDP);
- Wincor Nixdorf;
- Fortronic;
- Interbold;
- Microlec;
- Olivetti;
- ICL / Edacom;
- Schlumberger;
- Racal;
- Longini.

Software supporting a new instrument can be easily added with little or no impact to other modules in the system. Over the years and operating in the national and international markets, SM 3000 EPS has developed a flexible and open standard for interaction with POS terminals.

5.9. On-line interfaces support

Worldwide, SM 3000 EPS supports main host and third party interfaces.

This provides the ability to join hosts and other networks for authorization purposes. Many international interfaces are supported, such as Visa, MasterCard and American Express, they are commonly used to connect the SM 3000 EPS to other authorization networks.

Like all other SM 3000 EPS modules, the interface modules are constantly being developed to keep them in line with the latest standards.

Some examples of supported interfaces are:

- ISO8583 for communication with hosts and other systems;
- VISANET for authorization of ATMs and POS terminals in the VISA system;
- MasterCard for authorization of ATMs and POS terminals in the MasterCard system;
- PLUS to authorize cards in the PLUS Network;
- CIRRUS for CIRRUS Network card authorization;
- many other interfaces to support national and local networks.

5.10. VISA ISO interface support

The VISA interface module provides online access to the international VISA network in order to obtain authorization services. The module handles ATM and POS traffic from both the issuer and the merchant, supporting BASE I or ISO8583 message formats for debit cards. This allows you to handle a full set of transactions with a full range of issued cards.

5.11. MasterCard ISO interface support

This interface module provides access to the MasterCard International Authorization Network (BANKNET) in order to receive MasterCard authorization services. The module handles POS traffic from both the issuer and the merchant. The message formats used are compatible with the BANKNET ISO message standards.

5.12. Security

SM 3000 EPS supports a variety of transaction security options. These options protect the institution and its cardholders from fraud and include such functions as PIN number encryption, PIN translation, PIN verification, MAC and KEY generation / verification, 3DES AAV verification etc.

The available hardware and software security options set SM 3000 EPS apart from its competitors and are based on proven international standards such as 3DES, ANSI and ISO.

SM 3000 EPS provides 3DES-based encryption software as part of its standard products. In addition, SM 3000 EPS supports Hardware Security Modules, which support a much higher level of security than software encryption / decryption provides. SM 3000 EPS supports Hardware Security Modules developed by companies such as Thales and Futurex.

5.13. SQL-requests and reports

SM 3000 EPS can provide a wide range of reports in all parts of the system. SM 3000 EPS can automate reporting at the level of a device, institution, network, settlements of one or several networks. To do it we prepare SM 3000 EPS to integrate with a Django or other similar products.



For further information on the Django SQL explorer see <https://github.com/groveco/django-sql-explorer>

It allows quickly write and share SQL queries in a simple, usable SQL editor, preview the results in the browser, share links, download CSV files, and keep the information flowing. It supports multiple connections, to many different SQL database types, a schema explorer, query history (e.g. lightweight version control), a basic security model, in-browser pivot tables, and more.

So that, using SM 3000 EPS you can generate consolidated daily activity reports on settlement results for all transactions related to participating institutions and exchange networks. The system can also generate detailed reports on clearing, activity and statistics based on settlement results.

Reports are issued automatically at predetermined times. The reporting range is very broad and includes both daily and monthly data, individual transactions by device, cardholder and institution, and a number of summary reports based on this detailed information.

In addition to this, there are a number of online query capabilities to manage and maintain devices, communication lines, sessions, and communication channel statuses.

Transaction inquiries also provide instant access to transaction information related to the device, time and cardholder.

5.14. Data extraction and updating and tools

The Extract and Add processes are designed to update the SM 3000 EPS database and retrieve captured or recorded data.

The Extraction process prepares the captured SM 3000 EPS data for processing or analysis on the host computer. This can extract the following information:

- The card involved in the transaction;
- Institution participating in the transaction;
- Storage and transfer file;
- Online Service File.

Extracts can be performed in parallel with online transactions and can be configured to have little or no impact on the online system. Extraction can be done to tape or disc and performed automatically or manually.

The Update Process allows information on the host or card issuer to be updated based on the SM 3000 EPS database. The following information may be updated:

- Updated negative (Hot) map file (NEG);
- Updated Cardholder Authorization File (Positive) Authorization File (CAF);
- Updated Positive Balance File (PBF);
- Information from POS terminal;
- Information about the merchant.

Updates can be done manually or automatically and can be partial or complete. Update is a method by which clients can update the SM 3000 EPS database in terms of multiple records.

The update process runs in parallel with the operation of the system. The existing invoice files will continue to be updated until the new file is ready. The update process will then update the invoices with information from the transactions that occurred during the update process. This procedure, known as "impacting", ensures that the newly updated invoices are the most recent, which reduces the risk of fraud for the user.

5.15. User interfaces, access and operation

SM 3000 EPS has a number of utilities and tools designed to simplify the operational aspects of the system and provide the required level of security, using special Interface server. SM 3000 EPS web-based product screens are user friendly, technically inexperienced users can effectively use the system with minimal training. The interfaces access supports double authentication entrance approach, including one-time password sending by SMS possibility.

A comprehensive password-based input system is provided. Using internationally recognized cryptographic standards for passwords, passwords are changed and an exit time is automatically set. With an AMAZON cloud implementation we offer the AWS additional internal tools to use.

All files contained in the SM 3000 EPS system are fully accessible. Users can access files that control authorization, routing, and object definition within the system. Individual file and screen access can be user-defined using Read, Update, Add and Delete access, based on roles and routes.

Further access to the system of each user can be controlled by institution, time, device, function, and screen within the function, thus allowing access privileges to be set in order to effectively manage and control the user's access to system functions. This ensures that an individual institution only has access to those functions that belong to it and belong to it.

The collage displays five different views of the SM3000 system interface:

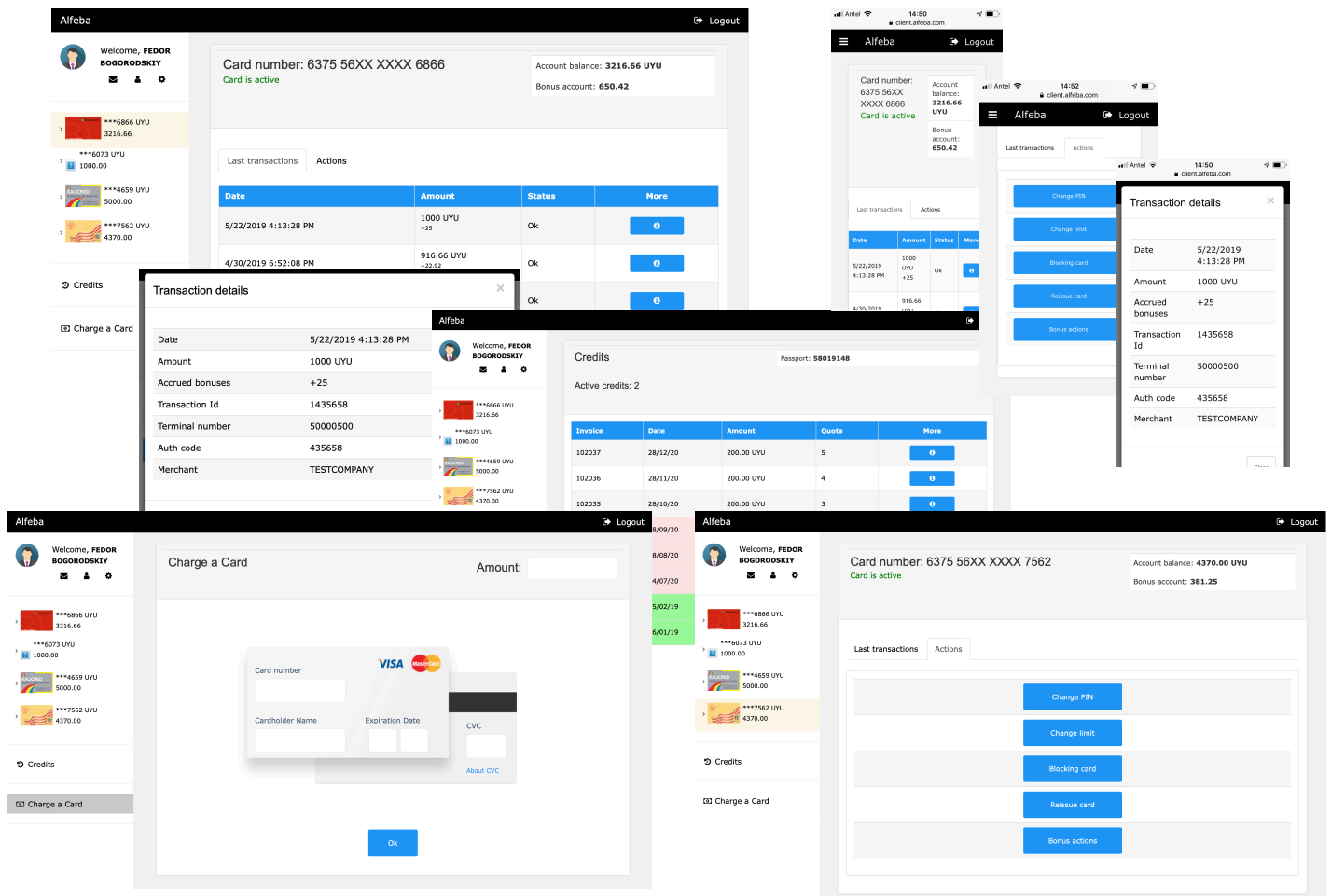
- Top Left:** 'Business Categories' page. It features a sidebar with 'Control Panel' and 'Business Categories' (Banks & Institutions, Merchants & Terminals, ATM, Profiles and Cards, Prevent Fraud & Chargebacks). The main area shows 'Banks & Institutions' and 'Merchants' with counts for Direct Members, Affiliated / Associated Members, Partners, Merchants, POS-terminals, Internet Terminals, and Payment Terminals.
- Top Right:** 'Register POS-terminal' page. It has tabs for 'General information', 'Configuration', and 'Status'. The 'General information' tab is active, showing fields for merchant name, date of manufacture, date of connection, terminal number, serial number, model, currency, and more.
- Middle Left:** 'Cards: Authorizations view' page. It shows a table of card transactions with columns: Number, DateTime, Pan, Auth Code, Terminal Number, Terminal Type, Merchant, Company, Amount in transaction currency, Transaction currency, Amount in account currency, Currency account, Fee, Transaction type, Status Code, MCC, RRM, Acquirer Code, and Acquirer Name.
- Bottom Left:** 'Informes' (Reports) page. It shows a table of card transactions with columns: ID, Pasaporte/C.I., Nombre, Apellido, Sexo, Fecha de nacimiento, Fecha Card, Fecha de Emisión, Importe, Codigo, and Status.
- Bottom Right:** 'Card search' page. It has a sidebar with 'Control Panel' and 'Business Categories' (Banks & Institutions, Merchants & Terminals, ATM, Profiles and Cards, Prevent Fraud & Chargebacks). The main area shows a search form with fields for Card number, First name, Last name, Organization, Code in the bonus system, Expiration date, Type, Status, Design, and Q Search.

The system has its own interfaces for the cardholders (Cardholder profiles), that can be customized for the customer's needs or used to develop the mobile phone applications.

Among the functions there are:

- transactions history check based on the card or banking account,
- balance check,
- purchase in credits and payments (installments),
- bonus points balance,
- bonus points history,
- card block,
- PIN change,
- card renewal solicitation,
- new credit limit solicitation,
- bonus Program management (to accumulate or to pay with bonus points),
- card charge with other external card (c2c) or with the banking account (direct debit),
- other functions.

The customer profile supports several cards management and multi currency and multi language approaches.



5.16. About authorization

New generation authorization system allows you to raise the procedures for setting up online authorization to a new qualitative level, when practically any business requirements for the development of authorization algorithms can be implemented without changing the core and will not require re-implementation costs when changing versions of the system itself. The integration of this system with the PRM product increases the efficiency of using online risk management, both in terms of more effective work to prevent fraud, and in terms of optimizing the use of system resources.

5.17. The main functions of the system in the framework of card issuance

Among the main functions are:

- Selective routing;
- Conditional processing methods - the number of parameters and conditions that affect the authorization response is much greater than that of the standard authorization process. It is possible to use data even from external databases and systems;
- Temporary adjustments to authorization processes - in case the business requires a temporary increase in inspections, or the temporary provision of new functions, this is easy to do, even knowing that after a short time the results of this work will not be needed. It will also allow you to make changes to the authorization processes for the period of peak seasons - periods of holiday shopping, mass summer vacations, etc.;
- Authorization related to the cardholder data - you can change the algorithms and parameters of authorizations, depending on certain customer parameters, which will allow you to flexibly and dynamically segment the base of cardholders;
- Transaction processing for VIP clients;
- Algorithm Changes in Emergencies - The ability to make changes to algorithms and processes quickly and reliably is especially important in emergency situations where every minute counts;
- Tactical risk management tools - for example, temporarily increase monitoring of a certain region or group of devices in order to quickly stop fraudulent activity;
- Local rule changes - some rules may vary within regions, or even different areas of a major city;
- Optimization of staff workload - changing the threshold of the Call Referral authorization code if the department responsible for servicing these requests is overloaded or temporarily out of work, reducing the flow of transactions on PRM On-Line if the Risk Department is unable to cope with the load, etc.

All these and a number of other tasks can be easily and efficiently solved with minimal costs thanks to the SM 3000 EPS product.

5.18. System design principles

Using new R&Ds in the cards industry we are working to improve the SM 3000 EPS processing architecture, based on the CORAL approach. So that, implemented with AMAZON AWS once, we've aggregated a number of the modern instruments of our applications processes, DBs and PCI DSS infrastructure support, that simplifies the data processing jobs for our customers.

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Chapter 6. Attachments

This chapter contains the next sections:

Section	Description	Page
6.1.	Terms and abbreviations	41
6.2.	External documents references	43

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6.1. Terms and abbreviations

3

3D-Secure Is an XML-based protocol designed to be an additional security layer for online credit and debit card transactions.

A

API Application programming interface

Authorization Is an approval from a card issuer, usually through a credit card processor, that the customer has sufficient funds to cover the cost of the transaction.

B

BO Back-office, of the SM3000 IAP, where the Operator's employers work to maintain the Platform jobs, as Merchants, Transactions, Agents, Reports and file exchange with a main Processing system.

C

Cardholder A person who owns a card, such as a cardholder of a credit card or debit card

ChargeBack Is a return of money to a payer. Most commonly the payer is a consumer. The chargeback reverses a money transfer from the consumer's credit card. The chargeback is ordered by the bank that issued the consumer's payment card.

F

FE Front-end, of the SM3000 IAP, where the cards authorizations are processed in on-line mode

I

IAP Internet acquiring platform. The Platform created as a separate application for the Payment operators and Payment facilitators.

ID Identification number (f.e. transaction ID or Merchant ID)

Incoming-File The data file, that Platform receives from the Bank's processor

L

Light API The interface to connect the Merchant's own platform to the SM3000 IAP

M

MasterCard MasterCard International payment system

O

Merchant	A legal entity carrying out trading activities on the Internet using the software provided by the system
MPI	Merchant Plug-in

P

Operator	Payment operator or Payment facilitator, that uses SM3000 IAP
Outgoing-File	The data file, that the Platform sends to the Bank's processor

R

PAN	Primary account number, or simply a card number, is the card identifier found on payment cards, such as credit cards and debit cards, as well as stored-value cards, gift cards and other similar cards.
Payment Gateway	A hardware-software complex developed and supported by a payment system that automates the acceptance of payments on the Internet.
Payment System	Payment system between users, financial organizations and business organizations. Allows you to pay, bills and purchases, transfer money.

S

Refund	A process in which a customer returns a product to the original retailer in exchange for money previously paid
Reversal	The operation of crediting funds to the payer's account as compensation for the cancellation of the provision of the service or the poorly rendered service.

T

Service	Merchant's service entry, registered for each MCC. It has its own parameters, fees etc.
SM3000	Sequoia Mosaic 3000. The processing platform of the cards issuing and acquiring processing, ATMs, POSs, e-commerce and m-commerce processing
System	A payment system that allows you to transfer money, accept payment for goods and services through various payment gateways.

V

Transaction	Within the framework of this service, a completely completed data exchange operation with a payment system, including debiting / crediting funds to an end user account.
VISA	VISA International payment system

6.2. External documents references

The manual uses the links to the other documentation of the SM3000 IAP, listed below:

Document code	Document name	Document Purpose	Document category
200101	SM3000: IAP. Functional description	Describes main functions of the SM 3000 EPS	User's manual

