

Smart Card Security Access Modules in VeriFone Omni 3350 Countertop and Omni 3600 Portable Terminals

With the proliferation of smart card solutions, VeriFone's use of multiple Security Access Modules in payment devices provides added security and convenience for banks, processors and merchants.

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Introduction

Responding to the rapid growth of smart cards.

Smart card solutions are being deployed worldwide. The use of smart cards for payment and payment-related applications is most widespread in Europe, but even in regions such as the United States where smart card acceptance has recently begun to build, a wide variety of loyalty and stored value applications are being introduced.

As smart card usage has proliferated, the variety of global, regional and proprietary smart card applications has expanded rapidly as well. This has created a need to securely support multiple applications using a single smart card-reading device. To address these requirements, VeriFone has incorporated Security Access Modules (SAMs) into its payment terminals.

First implemented on the Omni payment platform in 1995, SAMs allow acquiring banks, processors and merchants to conveniently update and add smart card applications, as well as to securely obtain financial data from the terminals. The SAMs come in two versions. The standard SAM is a micromodule. Not much larger than the computer chip that gives smart cards their intelligence, micro-SAMs require special care and expertise to handle properly due to their small size. Because of this, VeriFone Omni 3350 payment terminals also offer an optional full-sized SAM, which is the size of a typical smart card. Full-sized SAMs are ideal for many smart card solutions, such as loyalty applications, electronic benefits transfer (EBT) payments, and applications for the travel and lodging industry that require frequent updates and changes.

This primer will examine how the growth of smart card applications is placing increased demands on processors and merchants, and how VeriFone uses multiple SAMs to provide a convenient, yet secure means of handling smart card-based payment, payment-related and value-added applications.

Technology and Markets

A family of smart card products and applications.

Smart cards do not rely on a single technology. Rather, there are a number of different technologies that support a broad spectrum of applications.

Smart cards can generally be grouped into two classifications: memory cards and microprocessor chip cards.

- Memory cards are typically used for simple transactions, such as keeping track of the value in an electronic gift card or counting the minutes remaining on a prepaid phone card. Memory cards are able to store relatively small amounts of data (up to 2 Kbytes or so), that can be rewritten as needed.
- Microprocessor chip cards combine a processor with different types of memory, such as read-only memory (ROM) or random access memory (RAM) and data storage memory (EEPROM). The memory capacity of these chip-based cards is significantly higher than memory cards, up to as much as 32 Kbytes—with processor clock speeds of from 4 to 16 MHz. The ability of microprocessor chip cards to support advanced application environments and handle highly sophisticated schemes positions them to capture an increasing share of smart card applications.

Smart cards offer exceptional capabilities in two areas: providing payment services, ranging from credit or debit payments to electronic cash or cards used to keep track of loyalty rewards; and providing mobile security for transporting sensitive financial data or other information. This has given rise to an expanding list of payment, payment-related and value-added applications including telecommunication services, health services, pay television, parking/public transportation, personal identification, and retail loyalty schemes.

Emerging standards.

As smart cards come into wider usage, standards have emerged to encourage compatibility among platforms and solutions.

The most prominent of these is EMV, developed by three of the leading card associations; Europay, MasterCard and Visa. EMV specifications bring needed standardization to smart card-based debit and credit card processing. These specifications apply not only to the mechanical, electrical and logical interfaces between chip cards and payment devices, but also to application functionality. As EMV specifications are adopted in different regions around the globe, major benefits for banks, processors and merchants will ensure rapid acceptance.

VeriFone's Omni 3350 and Omni 3600 terminals fully comply with the latest version of EMV. In addition to industrywide standards such as EMV, a number of schemes are also emerging that may be applied to stored value applications. It is important for banks and processors to explore whether a particular smart card solution needs to adhere to one of these widely accepted standards before recommending an application to merchants.

Accelerating growth.

Smart card usage has been accelerating at a rapid rate since the mid-1990s. Led by applications in the telecommunications segment—which according to some estimates accounts for as much as 75 percent of the entire market—the number of smart cards worldwide has grown from a little more than 650 million in 1995 to a projected 2.5 billion in 2000.

Smart card applications targeted to telecommunications users demonstrate both the versatility and wide-ranging benefits of the technology. Applications range from the prepaid phone card, which uses a memory card in a simplistic, usually non-reloadable configuration, to a sophisticated digital mobile telephone network solution called GSM, which utilizes a microprocessor-based SIM card.

For the consumer, prepaid phone cards offer greater convenience, eliminating the need to carry change for phone calls and allowing cardholders to conveniently talk for extended periods of time. For service providers, these stored-value cards reduce costs by eliminating the time and effort involved in collecting coins and protecting public phones from theft and fraud. In addition, the cards increase revenues by encouraging callers to talk longer and—because cardholders pay up-front for talk time that is used over days, weeks or months—offering retailers the substantial benefit of monetary “float”. This win/win proposition for consumers and service providers has been the key to the cards’ wide acceptance in telecommunications.

An especially fast-growing niche is loyalty applications. As recently as 1995, smart card-based loyalty solutions were virtually non-existent. Today, in a number of countries such as Japan and the United Kingdom, loyalty cards are the main drivers of growth in smart card usage. As is the case in the telecommunications industry, the strong growth in loyalty is due to the way these applications benefit all parties. Merchants can improve customer relationships, enhance customer intimacy (through better knowledge of preferences and purchasing history) and offer promotions or discounts as desired. Customers clearly enjoy the easy access to special offers and a higher level of service overall, with a minimal impact on the shopping experience or changes required in spending habits.

With the number of applications continuing to diversify, growth of smart card solutions can be expected to rise substantially in the near future.

Security Access Modules

Providing convenient, yet secure access to smart card solutions.

A Security Access Module (SAM) essentially acts as a fraud protection and control mechanism for smart card applications running on POS terminals such as VeriFone's Omni 3350 countertop and Omni 3600 portable terminals, which feature integrated smart card capabilities. SAMs are typically installed in trays located on the underside of a terminal. On most manufacturers' models, a door on the terminal must be opened to insert or remove a SAM.

The chip that is embedded in the SAM contains proprietary information about a particular smart card solution. When a customer inserts a smart card into the card reader, the SAM uses this proprietary information to verify that the customer's smart card is valid. Then, it checks to see if that card is intended for the smart card application currently in use. All this happens within a matter of seconds. If everything checks out properly, the terminal begins to process the transaction.

In some cases, electronic payments from a customer may actually be captured and securely stored directly on the SAM. The merchant can deposit this cash value into his or her account either electronically or physically.

The need for multiple SAMs

Not all smart card-based loyalty or stored-value solutions rely on the same operating procedures, processing methods or standards. Because the embedded chip on each SAM stores proprietary information necessary to validate a card and match it to a particular application, it is not practical to have one SAM supporting multiple smart card solutions. As a result, as smart card applications proliferate, it has become desirable to have multiple SAMs available in a single POS terminal.

With multiple SAMs, merchants can take advantage of a variety of smart card-based programs at the same time. For example, a retailer might use one SAM to support Visa Cash, another for the Mondex electronic cash system, a third to handle stored-value gift cards, and still another SAM to implement a frequent shopper program. Each SAM would be responsible for checking a smart card when inserted, and ensuring that it is only used as part of a particular application.

The advantages of full-sized SAMs

Many smart card solutions require regular updates. For instance, an organization such as Visa or Mondex may issue new security information as frequently as every six months. If a store is running a proprietary loyalty program, information or procedures may need to be updated even more often.

Removing a SAM micromodule—which is not much larger than the embedded memory or IC chip itself—increases the complexity of maintenance and upgrades for processors, and is not recommended for merchants to handle on their own, unless they have trained support personnel. To simplify this process, VeriFone has developed payment devices that use full-sized SAMs.

A full-sized SAM is similar to a regular smart card. To update or add a new smart card solution, a processor or trained technical person employed by the merchant can easily open the tray, remove the old SAM, and insert the new full-sized card with the updated information.

SAMs also provide an easy and secure way to transport cash from the day's sales receipts for deposit into the merchant's bank account. The easiest way to do this is to transfer the value stored on the SAM onto a merchant smart card that is inserted into the primary smart card reader on the top of the device. Terminals such as the Omni 3350 can be programmed to accomplish this with just a few keystrokes. The merchant smart card can then be carried to the bank where the deposit will be made.

In some countries, a merchant may wish to use the SAM to physically take the payment value stored on the terminal to the bank. This may be due to a requirement of a particular solution or because the merchant perceives a risk in transferring electronic cash over telephone lines. With appropriate training, merchants can be shown how to remove the full-sized SAM, and replace it before opening for business the next day.

However they are used, versatile full-sized SAMs effectively protect sensitive financial data while making it more easy and efficient to accommodate changing application requirements.

Omni 3350 Countertop and Omni 3600 Portable Terminals

Designed for today's multi-application payment environment.

Featuring built-in smart card capabilities and multiple SAMs, VeriFone Omni 3350 countertop terminals and Omni 3600 portable terminals simplify the management of multiple smart card applications on a single terminal. The Omni 3350 offers up to five SAMs—including an optional full-sized SAM—to support a variety of smart card applications, from loyalty to stored value. The Omni 3600 portable offers up to three SAMs, along with the flexibility to take electronic payment processing anywhere that business takes place. This makes the Omni 3600 ideal for stadium and kiosk vendors, a range of mobile service providers such as cleaning services and delivery businesses, field sales people, and sidewalk sales for conventional retailers.

VeriFone's VeriX operating environment enables merchants to efficiently and securely run multiple payment, payment-related and value-added applications on a single terminal. In addition, VeriX-based terminals such as the Omni 3350 and Omni 3600 provide fast 32-bit processing, multi-tasking software and up to 3 Mbytes of dynamically allocated memory to meet the demanding performance requirements for EMV as well as the expanding array of applications.

Although it is unlikely that any user will immediately need to use all the SAMs, the number of modules in the Omni 3350 and Omni 3600 terminals provides assurance that processors and merchants will be able to keep pace with the latest developments in the dynamic world of e-payment.

Summary

Convenience and security in the palm of a hand.

In the 21st century, the retail marketplace can be expected to continue to evolve rapidly. Competition is intensifying. Consumer expectations are increasing. Smart card solutions offer retailers a number of benefits in addressing competitive challenges and improving operational efficiencies.

By providing banks, processors and merchants with the convenience they desire plus the security they demand, SAMs make it possible to take full advantage of the growing acceptance of smart card solutions. Both the VeriFone Omni 3350 countertop and Omni 3600 portable terminal—with multiple SAMs in a single device—enhance the ability of users to implement smart card programs as part of a successful retail strategy.

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