

American National Standard
for Financial Services

X9.8–2003

BANKING - PERSONAL IDENTIFICATION NUMBER
MANAGEMENT AND SECURITY

Part 1: PIN protection principles and techniques for online PIN
verification in ATM & POS systems

Secretariat:
Accredited Standards Committee X9, Inc.

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This ANSI Standard is based on ISO 9564-1:2002(E) **Banking — Personal Identification Number (PIN) management and security — Part 1: PIN protection principles and techniques for online PIN verification in ATM and POS systems**. The ISO 9564-1:2002(E) has been reproduced in its entirety with the addition of "ANSI NOTE"s where required to adapt the text for use as an ANSI Standard. Where applicable, references to ANSI standards have been added.

Specific references to "ISO 9564" in the original ISO 9564 have been replaced with "ISO 9564 [this standard]", for the purpose of clarity.

"ANSI NOTE"s have been added to the following sections of ISO 9564-1:2001(E):

5.1	6.2 (two Notes)	6.3.3
7.2.2	7.3.3.3	8.3.1
Annex A	Annex E	

Annex A, General Principles of Key Management, has been superseded by ANS X9.24-2002, Retail Financial Services Symmetric Key Management Part 1: Using Symmetric Techniques

Annexes A, B, C, D, E, F and G are informative annexes, presented for information only.

ANS X9.8 consists of the following parts, under the general title Banking - Personal Identification Number (PIN) Management and Security:

- Part 1: PIN protection principles and techniques for online PIN verification in ATM & POS systems
- Part 2: Approved algorithm(s) for PIN encipherment

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Introduction

The Personal Identification Number (PIN) is a means of verifying the identity of a customer within an electronic funds transfer (EFT) system.

The objective of PIN management is to protect the PIN against unauthorised disclosure, compromise, and misuse throughout its life cycle and in so doing to minimise the risk of fraud occurring within EFT systems. The secrecy of the PIN needs to be assured at all times during its life cycle which consists of its selection, issuance, activation, storage, entry, transmission, validation, deactivation, and any other use made of it.

PIN security also depends upon sound key management. Maintaining the secrecy of cryptographic keys is of the utmost importance because the compromise of any key allows the compromise of any PIN ever enciphered under it.

Wherever possible, this part of ISO 9564 [this standard] specifies requirements in absolute terms. In some instances a level of subjectivity cannot be practically avoided especially when discussing the degree or level of security desired or to be achieved.

The level of security to be achieved needs to be related to a number of factors, including the sensitivity of the data concerned and the likelihood that the data will be intercepted, the practicality of any envisaged encipherment process, and the cost of providing, and breaking, a particular means of providing security. It is, therefore, necessary for each card Acceptor, Acquirer and Issuer to agree on the extent and detail of security and PIN management procedures. Absolute security is not practically achievable; therefore, PIN management procedures should implement preventive measures to reduce the opportunity for a breach in security and aim for a "high" probability of detection of any illicit access or change to PIN material should these preventive measures fail. This applies at all stages of the generation, exchange and use of a PIN, including those processes that occur in cryptographic equipment and those related to communication of PINs.

This part of ISO 9564 [this standard] is designed so that Issuers can uniformly make certain, to whatever degree is practical, that a PIN, while under the control of other institutions, is properly managed. Techniques are given for protecting the PIN-based customer authentication process by safeguarding the PIN against unauthorised disclosure during the PIN's life cycle.

This standard includes the following annexes:

- a) annex A covers general principles of key management;
- b) annex B covers techniques for PIN verification;
- c) annex C deals with implementation concepts for a PIN entry device for online PIN encipherment;
- d) annex D identifies an example of pseudo-random PIN generation;
- e) annex E indicates additional guidelines for the design of a PIN entry device;
- f) annex F specifies guidance on clearing and destruction procedures for sensitive data;
- g) annex G gives information for customers.

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In ISO 9564-2, [this standard - part 2] approved encipherment algorithms to be used in the protection of the PIN are specified. Application of the requirements of this part of ISO 9564 [this standard] requires bilateral agreements to be made, including the choice of algorithms specified in ISO 9564-2 [this standard - part 2].

This part of ISO 9564 [this standard] is one of a series that describes requirements for security in the retail banking environment, as follows:

ISO 9564-2:1991, *Banking - Personal Identification Number management and security - Part 2., Approved algorithm(s) for PIN encipherment.*

ISO DIS 9564-3, *Banking - Personal Identification Number management and security - Part 3, PIN protection principles for offline PIN handling in ATM and POS systems¹*

ISO 10202, *Financial transaction cards - Security architecture of financial transaction systems using integrated circuit cards –(all parts)*

ISO 11568, *Key management (retail) - (all parts)*

ISO 13491, *Secure cryptographic devices - (all parts)*

ISO 15668, *Banking - Financial transaction cards - Secure file transfer (retail)*

ISO DIS 16609, *Banking - requirements for message authentication¹*

Suggestions for the improvement of this standard will be welcome. They should be sent to the ASC X9 Secretariat, Accredited Standards Committee X9, Incorporated, P. O. Box 4035, Annapolis, MD 21403.

This Standard was processed and approved for submittal to ANSI by the Accredited Standards Committee on Financial Services, X9. Committee approval of the Standard does not necessarily imply that all the committee members voted for its approval.

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Omgeo
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Paychex Inc
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Piracle
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Pitney Bowes, Inc.
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PNC Bank, NA,
Pulse EFT Association
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R Squared Academy Ltd.
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RDM Corporation
RDM Corporation
Relizon
Relizon
Relyco Sales Inc
Reynolds and Reynolds Co.
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Rosetta Technologies
Rosetta Technologies
RSA Security
Schwab Capital Market L.P.
Schwab Capital Market L.P.
Secure Products
Secure Products
Silas Technologies
Silas Technologies
Software and Information Industry Association
Software and Information Industry Association
Software and Information Industry Association
Source Technologies Inc
Source Technologies Inc
Standard and Poors CUSIP Bureau
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Standard Register Company
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Star Systems, Inc.
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Star Systems, Inc.
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Stored Value Systems
Sun Microsystems PS
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Suntrust Banks
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Thales e-Security, Inc.	Peter Davies
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Banking — Personal Identification Number management and security —

Part 1: Basic principles, and requirements for online PIN handling in ATM and POS systems

1 Scope

This part of ISO 9564 [this standard] specifies:

- a) Basic *principles* and techniques which provide the minimum security measures required for effective international PIN management. These measures are applicable to those institutions responsible for implementing techniques for the management and protection of PINs.
- b) PIN protection techniques applicable to financial transaction card originated transactions in an online environment and a standard means of interchanging PIN data. These techniques are applicable to those institutions responsible for implementing techniques for the management and protection of the PIN at Automated Teller Machines (ATM) and acquirer sponsored Point-of-Sale (POS) terminals.

The provisions of this part of ISO 9564 [this standard] are not intended to cover:

- a) PIN management and security in the offline PIN environment, which is covered in part 3,
- b) PIN management and security in the electronic commerce environments, which is to be covered in a subsequent part of ISO 9564 [this standard],
- c) the protection of the PIN against loss or intentional misuse by the customer or authorised employees of the issuer,
- d) privacy of non-PIN transaction data,
- e) protection of transaction messages against alteration or substitution, e.g. an authorisation response to a PIN verification,
- f) protection against replay of the PIN or transaction,
- g) specific key management techniques.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 9564 [this standard]. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 9564 [this standard] are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO/IEC 7812:2000 *Identification cards--Numbering system and registration procedure for issuer identifiers.*