Advanced Card Systems Ltd.
Card & Reader Technologies

CryptoMate64
USB Cryptographic Token

Technical Specifications V1.03

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Table of Contents

List of Figures

1.0. Introduction

CryptoMate64 is a lightweight USB token that provides users with strong authentication solutions and the CCID compliant version of the CryptoMate token. Similarly, it is a lightweight token, weighing only 6 grams, making it one of the most portable and most secured cryptographic USB token in the market. It enables users to perform digital signature, email encryption, online payments, Windows log-on and other Public Key Infrastructure (PKI) applications.

CryptoMate64 has a built-in ACOS5-64 chip which has 64 KB of EEPROM complies with various international standards such as with CC EAL5+, ISO 7816 1-4, 8, 9. CryptoMate64's casing is designed to be tamper evident so that any unauthorized physical access will be easily visible. Aside from this, it also protects sensitive credentials and cryptographic keys since cryptographic operations such as RSA-4096, SHA-256, AES-256 and 3K3DES are performed inside the ACOS5-64-based Smart Card IC inside the token. With this, important and sensitive information is protected from being hacked or sniffed achieving a high level of security for applications.

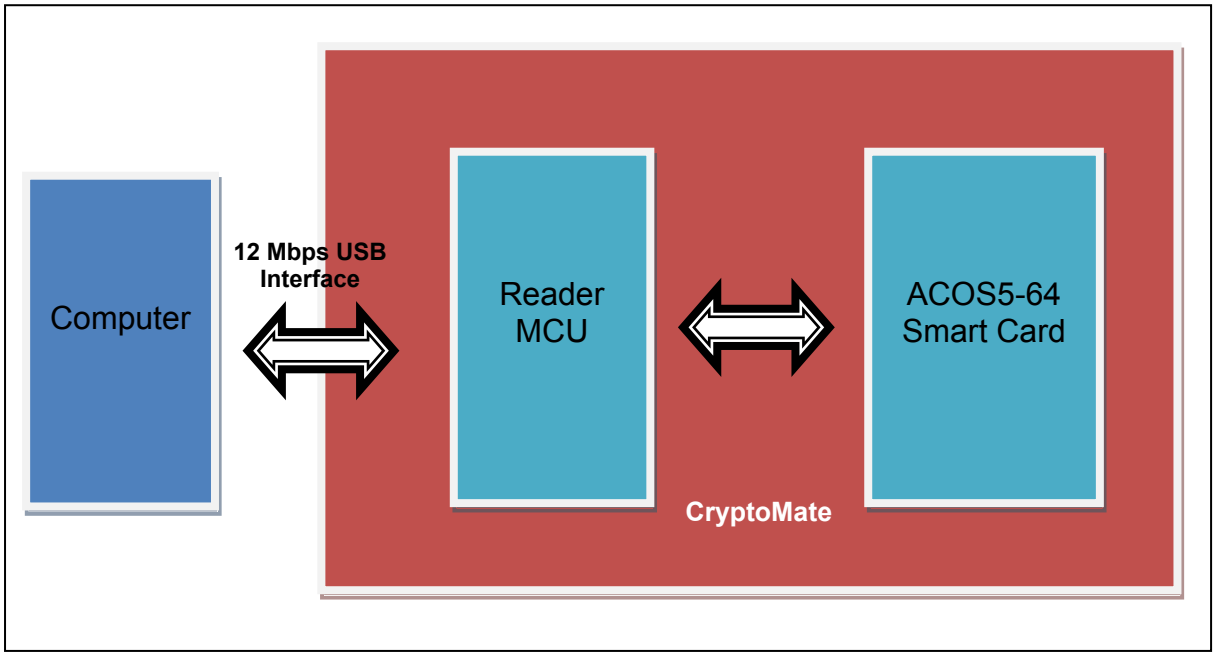


Figure 1: CryptoMate64 System Block Diagram

Furthermore, CryptoMate-64 supports a number of security infrastructures and applications, including:

- Microsoft® Crypto-API, Microsoft® CNG and PKCS #11 Middlewares
- Secure Online Certificate Generation
- Microsotf® Outlook, Windows® Mail, Microsoft® Outlook Express and Mozilla Thunderbird mail signing and encryption (S/MIME)
- Mozilla Firefox
- Internet Explorer®
- Windows® Smart Card Log-on
- Microsoft® Office
- Open Office
- Adobe® Reader®
- Lotus Notes®

2.0. Features

2.1. Cryptographic Smart Card and Crypto-processor Features

- Embedded ACOS5-64 chip
- User memory: 64 KB of EEPROM
- Common Criteria EAL5+ (Chip Level)
- ISO 7816 Parts 1, 2, 3, 4, 8, 9 Compliant
- FIPS 140-2 (US Federal Information Processing Standards) compatible
- Supports ISO 7816 Part 4 File Structures: Transparent, Linear Fixed, Linear Variable, Cyclic
- Cryptographic capabilities:
  - DES, 3DES and 3K3DES with 64/128/192 bit keys data encryption in ECB and CBC mode. AES 128/192/256-bit is also supported
  - Secure on-card RSA key pair generation with 512-bit to 4096-bit keys in 256-bit steps
  - RSA computation and verification with 512-bit to 4096-bit keys in 256-bit steps
  - Private and secret key file read access can be set to “Never”
  - Mutual authentication (terminal-to-card and card-to-terminal) using Triple DES with session key generation for encryption and MAC
  - SHA-1 and SHA-256 hashing algorithm
  - Secure Messaging function for confidential and authenticated data transfers
  - File access condition capability with ISO 7816 compliant Secure Attribute - Compact. File access is only allowed if the proper security conditions are met (e.g., PIN submission)
  - Command execution condition capability per Dedicated File (DF) with ISO 7816 compliant Secure Attribute - Extended. Commands are allowed only if the proper security conditions are met (e.g., PIN submission)
- Provides ease of integration with various software applications such as Internet Explorer, Mozilla, Microsoft Office, and Adobe PDF Reader with the use of ACS middlewares. Configurable baud rates
- Configurable ATR
- Customizable Key and PIN code
- Supports X.509 V3 Certificate Storage and SSL v3

2.2. Token Features

- Extremely lightweight: 6 grams
- Pocket size: 53.5 mm x 15.7 mm x 7.8 mm
- Keychain hole
- USB 2.0 Full Speed Interface
- CCID Compliant (Plug and Play)
- Smart card power supply through USB port
- NSH-1 (ICP-Brazil) Certified
- CE and FCC Certified
- Microsoft® WHQL Certified
- RoHS Compliance
- Tamper-evident casing
- Blue Status LED

3.0. Typical Applications

- e-Government
- e-Banking and e-Payment
- e-Healthcare
- Network Security
- Logical Access Control
- Public Key Infrastructure
  - Digital Signature
  - Secured Email
  - Windows Smart Card Log-on

4.0. Middleware

To use the CryptoMate64 for PKI applications with your own digital certificates, an applicable middleware is needed. ACS provides the ACS CSP and ACS KSP middleware for MS-CAPI applications, and the ACS PKCS #11 middleware for all other applications such as Mozilla Firefox as shown in the figure below:

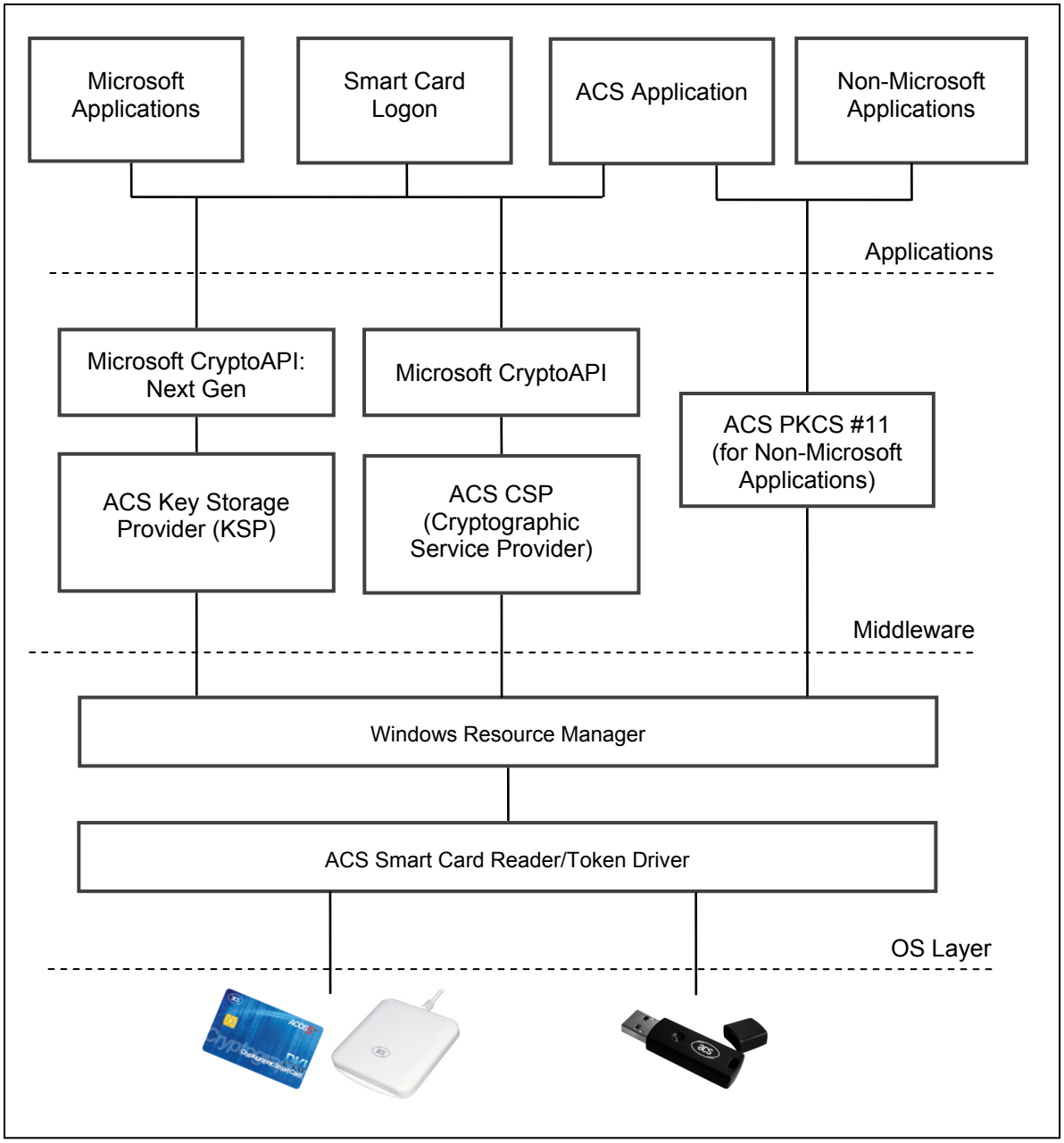
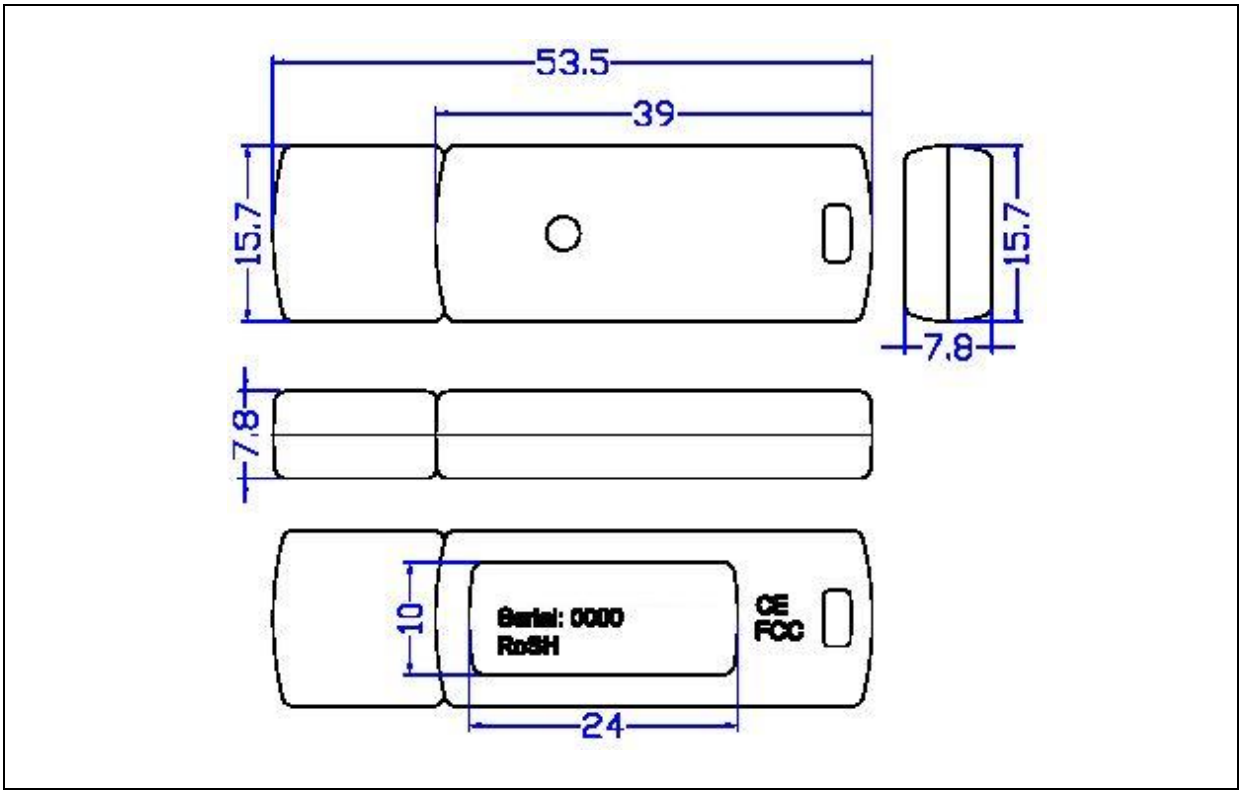


Figure 2: Middleware Diagram

Please contact us at info@acs.com.hk for inquiries about the middleware support for the CryptoMate64 token.

5.0. Technical Specifications



Universal Serial Bus Interface	
Type	USB Full Speed, Four Lines: +5 V, GND, D+ and D-
Power Source	From USB
Speed	12 Mbps (Full Speed)
ACOS5 Cryptographic Smart Card Chip	
Memory	64 KB of EEPROM
Endurance	500,000 write/erase cycles
Data Retention	10 years
Cryptographic Capability	3K3DES, 3DES (ECB, CBC), MAC, AES-128, AES-192, AES-256, RSA-512, 1024/2048/3072/4096 bits and Secure Messaging
Hashing Capability	SHA-1, SHA-256
Middleware Support	ACS PKCS #11, ACS CSP (based on Microsoft's CryptoAPI), ACS KSP (based on Microsoft's CNG)
Physical Specifications	
Dimensions	53.5 mm (L) x 15.7 mm (W) x 7.8 mm (H)
Color	Black
Weight	6 g
Status LED	Blue Color
Casing	Tamper-evident
Others	Keychain hole for portability
Operating Conditions	
Temperature	0 °C – 50 °C
Humidity	40% – 80%
Certifications/Compliance	
NSH-1 (ICP Brazil), FIPS 140-2 Compatible, Common Criteria EAL5+ (Chip Level), X.509 V3 Certificate Storage, SSL v3, CE, FCC, RoHS, PC/SC, USB Full Speed Microsoft® WHQL for Windows® 2000, Windows® XP, Windows Vista®, Windows® 7, Windows® 8, Windows® 8.1, Windows® Server 2008 R2, Windows® Server 2012, Windows® Server 2012 R2	

Device Driver Operating System Support

Windows® XP, Windows Vista®, Windows® 7, Windows® 8, Windows® 8.1, Windows® Server 2003, Windows® Server 2003 R2, Windows® Server 2008, Windows® Server 2008 R2, Windows® Server 2012, Windows® Server 2012 R2
Linux®, Mac OS®, Android™ 3.1 and above