

March 05, 2024

Alexander Schwarz

IPS Group Inc.

7737 Kenamar CT

San Diego, CA 92121

UNITED STATES OF AMERICA

Re: *EMVCo Letter of Approval - Contact Terminal Level 2*

EMV Application Kernel: e-Kardia Version e-Kardia-4.4.A

Approval Number(s): 2-05342-1-1S-ELIT-0324-4.4a
2-05342-1-1OS-ELIT-0324-4.4a

The EMV Application Kernel has been tested on the following terminal

Terminal: **UNIV-EMV-CT**

PinPad: **n/a**

Operating System: **1OS = FreeRTOS Version 10.0.1**

Renewal Date: 09-Feb-2028

Report ID Session 1: **ELITT_LAB_RE_LEVEL2-IPS GROUP, INC.-UNIV-EMV-CT-2023-822-P01**
Version 2.0 - ELITT

Kernel Checksum:

| |
|--|
| BBF35178453185B872D08694A1C71C2265F47F16 |
|--|

Configuration Checksum:

| Config | Vendor Config ID | Terminal | Checksum |
|--------|------------------|----------|--|
| 1S | | 25 | 0AE43D1C3CAE676B8E577811F460E57D986EF6BB |

Dear Alexander Schwarz:

EMVCo, LLC ("EMVCo"), a Delaware limited liability company, has received your request for Level 2 terminal type approval for the EMV Application Kernel identified above (hereafter referred to as the "Application"). In connection with your request, we have reviewed all test file number(s) listed above.

After assessing such file(s), EMVCo has found reasonable evidence that the submitted samples of the above referenced Application sufficiently conform to EMV Integrated Circuit Card Specifications for Payment Systems, Version 4.4 of October 2022.

EMVCo hereby grants your Application EMVCo Type Approval for Terminal Level 2, based on the requirements stated in the EMV 4.4 Specifications. Please note that EMVCo may publish this letter and publicly identify your Application as an approved Application, including in EMVCo's published list of approved Applications.

EMVCo's grant to your Application is subject to and specifically incorporates (i) the General Terms and Conditions to the Letter of Approval enclosed as Exhibit A, and (ii) the Specific Terms and Conditions to the Letter of Approval attached hereto as Attachment 1. Because EMVCo's grant is subject to such limitations, including certain events of termination, you and any third parties should confirm that such approval is current and has not been terminated by referring to the list of approved Applications published on the EMVCo website (www.emvco.com).

Please note that EMVCo makes certain logos available for use in connection with an Application that has received EMVCo approval. To obtain permission to use the "EMV Approved" certification mark, please contact EMVCo to request a license agreement.

This Letter of Approval is valid while the approval number is posted on the EMVCo website.

EMVCo, LLC, a Delaware limited liability company

By:

Name: Frédéric Fortin

Title: EMVCo Terminal Testing Group Chair

Note:

The Random Number Generator is part of the EMV specifications. This Contact Level 2 Kernel utilizes a specific Hardware component in the tested terminal to generate random numbers. To be EMV compliant, this Contact Level 2 Kernel shall be used in conjunction with terminals having this specific hardware component.

| Terminal Capabilities | | Value Supported |
|--|--|-----------------|
| Card Data Input Capability | | |
| Manual Key Entry | | No |
| Magnetic Stripe | | Yes |
| IC with Contacts | | Yes |
| CVM Capability | | |
| Plaintext PIN for ICC Verification | | No |
| Enciphered PIN for online Verification | | No |
| Signature (Paper) | | No |
| Enciphered PIN for offline Verification (RSA ODE) | | No |
| No CVM Required | | Yes |
| Biometric | | No |
| Offline Finger | | No |
| Online Finger | | No |
| Offline Facial | | No |
| Online Facial | | No |
| Offline Palm | | No |
| Online Palm | | No |
| Offline Iris | | No |
| Online Iris | | No |
| Offline Voice | | No |
| Online Voice | | No |
| Security Capability | | |
| Static Data Authentication and Dynamic Data Authentication | | Yes |
| Card Capture | | No |
| Combined Dynamic Data Authentication / Application Cryptogram Generation | | Mode 1 |
| Transaction Type Capability | | |
| Cash | | No |
| Goods | | Yes |
| Services | | Yes |
| Cash Back | | No |
| Inquiry | | No |
| Transfer | | No |
| Payment | | No |
| Administrative | | No |
| Cash Deposit | | No |
| Terminal Data Input Capability | | |
| Does terminal have keypad | | No |
| Numeric Keys | | No |
| Alphabetic and Special Character Keys | | No |
| Command Keys | | No |
| Function Keys | | No |
| Terminal Data Output Capability | | |
| Print, Attendant (Mandatory for terminals supporting signature) | | No |
| Print, Cardholder | | No |
| Display, Attendant (Mandatory for Attended terminals) | | No |
| Display Cardholder | | No |

| Terminal Capabilities | | Value Supported |
|--|--|------------------|
| Terminal Data Output Capability | | |
| Code Table 10 | | No |
| Code Table 9 | | No |
| Code Table 8 | | No |
| Code Table 7 | | No |
| Code Table 6 | | No |
| Code Table 5 | | No |
| Code Table 4 | | No |
| Code Table 3 | | No |
| Code Table 2 | | No |
| Code Table 1 | | Yes |
| Application Selection | | |
| Support PSE selection Method | | Yes |
| Support Cardholder Selection & Confirmation | | No |
| Does Terminal have a preferred order of displaying applications | | No |
| Does terminal perform partial AID selection | | Yes |
| Does the terminal have multi language support | | Yes |
| Does the terminal support the EMV Language Selection method | | Yes |
| Does the terminal support the Common Character Set as defined in Annex B table 20 Book 4 | | Yes |
| Selectable Kernel Configurations | | |
| Is your Multi-Configuration Kernel capable of dynamically selecting a configuration at the time of transaction | | No |
| Data Authentication | | |
| What is the maximum supported Certificate Authority Public Key Size (Mandatory for terminals supporting Data Authentication with minimal support for 248 bytes) | | 248 |
| What exponents does the terminal support (Mandatory for terminals supporting Data Authentication, 3 and $2^{16}+1$) | | 3 and $2^{16}+1$ |
| During data authentication does the terminal check validity for revocation of Issuer Public Key Certificate | | No |
| When supporting certificate revocation, what is the Certificate Revocation List format? | | N/A |
| Does the terminal contain a default DDOL (Mandatory for terminals supporting DDA) | | Yes |
| Is operator action required when loading CA Public Key fails | | No |
| CA Public Key verified with CA Public Key Check Sum | | Yes |
| Cardholder Verification Method | | |
| Terminal supports bypass PIN Entry | | No |
| Terminal supports Subsequent bypass PIN Entry | | No |
| Terminal supports Get Data for PIN Try Counter | | No |
| Terminal supports Fail CVM | | Yes |
| Are amounts known before CVM processing | | Yes |
| Terminal Risk Management | | |
| Floor Limit Checking (Mandatory for offline only terminals and offline terminals with online capability) | | Yes |
| Random Transaction Selection (Mandatory for offline terminals with online capability, except when cardholder controlled) | | Yes |
| Velocity Checking (Mandatory for offline only terminals and offline terminals with online capability) | | Yes |
| Transaction Log | | No |
| Exception File | | No |
| Performance of Terminal Risk Management irrespective of AIP setting (expected behavior) | | Yes |

| Terminal Capabilities | | Value Supported |
|---|--------------|---|
| Terminal Action Analysis | | |
| Does the terminal support Terminal Action Codes | | Yes |
| Can the Terminal Action Codes be deleted or disabled? | | Yes |
| If yes what are the default TAC values supported? (according to Book 3 Section 10.7) | TAC Denial: | 0000000000 |
| | TAC Online: | 0000000000 |
| | TAC Default: | 0000000000 |
| How does Offline Only Terminal process Default Action Codes prior to First Generate AC? (Offline Only Terminal shall support one option) | | N/A |
| How does online only terminal process TAC/IAC-Default when unable to go online? | | N/A |
| Completion Processing | | |
| Transaction Forced Online Capability | | No |
| Transaction Forced Acceptance Capability | | No |
| Does terminal Support advices | | No |
| Does the terminal support Issuer initiated Voice Referrals | | No |
| Does the terminal support Batch Data Capture | | Yes |
| Does the terminal support Online Data Capture | | Yes |
| Does the terminal support a Default TDOL | | Yes |
| If a Default TDOL is supported, can this default TDOL be not configured (or not loaded) in the terminal | | Yes |
| Default TDOL TVR bit set before or after the 1st Generate AC Terminal Action Analysis | | After |
| Exception Handling | | |
| What is the POS Entry Mode value when IC cannot be read and the transaction falls back using Magstripe (Mandatory for attended terminals) | | 80 |
| Miscellaneous | | |
| Is the terminal equipped with a PIN Pad | | No |
| Is the amount and PIN entered at the same keypad | | No |
| Is the ICC/Magstripe Reader combined | | Yes |
| If Combined ICC/Magstripe reader is supported, is Magstripe read first | | No |
| Does the terminal support account type selection | | No |
| Does the terminal support 'on fly' script processing (not recommended behavior) | | No |
| Is the Issuer Script device limit greater than 128 bytes | | No |
| If the Issuer Script device limit is greater than 128 bytes, what is the value supported | | |
| Does the terminal support Internal Date Management | | Yes |
| Is the Level 2 Contact Kernel Random Generator using the algorithm described in Book2, section 11.3 | | No |
| If the Level 2 Contact Kernel Random Generator is not using the algorithm described in Book2, section 11.3, is this function PCI approved | | Yes |
| If the Level 2 Contact Kernel Random Generator is not using the algorithm described in Book2, section 11.3, describe the function (such as algorithm used, etc) | | Maxim MAX32550 True Random Generator. Passes NIST 800-22 and DIEHARD test suite. |
| Is the Level 2 Contact Kernel Software dependent on the Terminal Hardware | | Yes |
| If answer to previous question is Yes, describe the function and the Hardware | | The TRNG is integrated in the MAX32550 SoC. It's battery-backed Real Time Clock, environmental and tamper detection circuitry to facilitate system-level security for the application. For more details refer to the MAX32550 reference manual. |
| Are the Cryptographic functions (RSA, Hash, etc) of the Level 2 Contact Kernel Software dependent on the Terminal Hardware | | No |
| If answer to previous question is Yes, describe the Hardware | | |
| Is any other functions of the Level 2 Contact Kernel Software dependent on the Terminal Hardware | | No |
| If answer to previous question is Yes, describe the functions and the Hardware | | |

| Terminal Capabilities | | Value Supported |
|---|--|-----------------|
| Miscellaneous | | |
| Does the terminal support Receipt (by printing or any electronic means)? | No | |
| Can Kernel output data for declined transactions be verified during Type Approval? | No | |
| List the Currency Codes supported as for ISO 4217 | 826 840 978 | |
| Does the terminal support the Application Selection Registered Proprietary Data (ASRPD)? | No | |
| List the Language(s) supported as for ISO 639 (minimum one shall be declared, and up to 4 if Multiple Languages are supported) | Eng Fra | |
| Can the Kernel be configured so the data object 'Terminal Risk Management Data' '9F1D' is absent or configured with no value (00 is a value)? | Yes | |
| Can the Transaction Sequence Counter (TSC) be personalized to any value? | No | |
| If answer to previous question is Yes, what is the Maximum Value of the Transaction Sequence Counter? | | |
| Checksum | | |
| Does the product comply with the Checksum rules as defined in Contact Terminal Level 2 administrative process | Yes | |
| This is an Initial submission or Subsequent submission or renewal of the original approved product prior to the effective date of checksum rules (cf Terminal Type Approval Bulletin No. 134) | n/a | |
| Configuration Checksum (Static Kernel only) | 0AE43D1C3CAE676B8E577811F460E57D986EF6BB | |

Attachment 1

Specific Terms and Conditions to the Letter of Approval

Restriction:

None