

October 10, 2016



Mr. Tommy Fung
Spectra Technologies Holding Co., Ltd
Unit 1301-09, 19-20,
Tower 2, Grand Century Place,
193 Prince Edward Road West
Kowloon
HONG KONG

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

EMV Application Kernel: EMVDLL Version V5.2

Approval Number(s): 2-03692-1-1C-BCTS-1016-4.3.e
2-03692-1-2C-BCTS-1016-4.3.e
2-03692-1-3C-BCTS-1016-4.3.e
2-03692-1-4C-BCTS-1016-4.3.e
2-03692-1-5C-BCTS-1016-4.3.e
2-03692-1-1P-BCTS-1016-4.3.e
2-03692-1-1OS-BCTS-1016-4.3.e

The EMV Application Kernel has been tested on the following terminal

Terminal: T1000
PinPad: 1P = PR500, SPECTRARM9 V1.2
Operating System: 1OS = SPECTRARM9 Version 3.7

Renewal Date: 22-Sep-2019

Report ID Session 1: **TEMV1602161 - Beijing Unionpay Card Technology Co., Ltd. Shenzhen Branch**

Kernel Checksum:

B1FE5D40

Configurations Checksums:

Config	Vendor Config ID	Terminal	Checksum
1C	E112	22	E9D5544D
2C	E113	22	E5FF5077
3C	E116	22	E9D5D444
4C	E117	22	E5FFD06E
5C	E118	22	8851F2C9

PIN Pads Checksums:

PinPad	Checksum
1P	5A297F7F

Dear Mr. Fung:

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 4.3 of November 2011.

EMVCo hereby grants your Application EMVCo Type Approval for Terminal Level 2, based on the requirements stated in the EMV 4.3 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.

Spectra Technologies Holding Co., Ltd

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 Type Approval

Note:

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

Terminal Capabilities	1C	2C	3C	4C	5C					
Card Data Input Capability										
Terminal Type	22	22	22	22	22					
Manual Key Entry	Yes	Yes	Yes	Yes	Yes					
Magnetic Stripe	Yes	Yes	Yes	Yes	Yes					
IC with Contacts	Yes	Yes	Yes	Yes	Yes					
CVM Capability										
Plaintext PIN	Yes	Yes	Yes	Yes	Yes					
Online Enciphered PIN	Yes	No	Yes	No	Yes					
Signature (Paper)	Yes	Yes	Yes	Yes	Yes					
Offline Enciphered PIN	Yes	Yes	Yes	Yes	Yes					
No CVM	No	No	No	No	Yes					
Security Capability										
SDA & DDA	Yes	Yes	Yes	Yes	Yes					
Card Capture	No	No	No	No	No					
CDA	Mode 1	Mode 1	Mode 1	Mode 1	Mode 1					
Transaction Type Capability										
Tran Type - Cash	Yes	Yes	Yes	Yes	Yes					
Tran Type - Goods	Yes	Yes	Yes	Yes	Yes					
Tran Type - Services	Yes	Yes	Yes	Yes	Yes					
Tran Type - Cash Back	Yes	Yes	Yes	Yes	Yes					
Tran Type - Inquiry	No	No	No	No	No					
Tran Type - Transfer	No	No	No	No	No					
Tran Type - Payment	No	No	No	No	No					
Tran Type - Admin	No	No	No	No	No					
Tran Type - Cash Deposit	No	No	No	No	No					
Terminal Data Input Capability										
Keypad	Yes	Yes	Yes	Yes	Yes					
Numeric Keys	Yes	Yes	Yes	Yes	Yes					
Alpha and Special Character Keys	Yes	Yes	Yes	Yes	Yes					
Command Keys	Yes	Yes	Yes	Yes	Yes					
Function Keys	Yes	Yes	Yes	Yes	Yes					
Terminal Data Output Capability										
Print, Attendant	Yes	Yes	Yes	Yes	Yes					
Print, Cardholder	No	No	No	No	No					
Display, Attendant	Yes	Yes	Yes	Yes	Yes					
Display, Cardholder	No	No	No	No	No					
Code Table 10	No	No	No	No	No					
Code Table 9	No	No	No	No	No					
Code Table 8	No	No	No	No	No					
Code Table 7	No	No	No	No	No					
Code Table 6	No	No	No	No	No					
Code Table 5	No	No	No	No	No					
Code Table 4	No	No	No	No	No					
Code Table 3	No	No	No	No	No					
Code Table 2	No	No	No	No	No					
Code Table 1	Yes	Yes	Yes	Yes	Yes					

(continued)	1C	2C	3C	4C	5C					
Application Selection										
PSE	Yes	Yes	Yes	Yes	Yes					
Cardholder Confirmation	Yes	Yes	Yes	Yes	Yes					
Preferred display order	No	No	No	No	No					
Partial AID Selection	Yes	Yes	Yes	Yes	Yes					
Multi language	No	No	No	No	No					
EMV Language Selection method	No	No	No	No	No					
Common Character Set	Yes	Yes	Yes	Yes	Yes					
Data Authentication										
MAX CA Public key	248	248	248	248	248					
Exponents	3 and 2 ¹⁶ +1	3 and 2 ¹⁶ +1	3 and 2 ¹⁶ +1	3 and 2 ¹⁶ +1	3 and 2 ¹⁶ +1					
Revocation of Issuer PK Certificate	Yes	Yes	Yes	Yes	Yes					
Certificate Revocation List Format	RID, CA Public Key Index, Certificate Serial Numbe	RID, CA Public Key Index, Certificate Serial Numbe	RID, CA Public Key Index, Certificate Serial Numbe	RID, CA Public Key Index, Certificate Serial Numbe	RID, CA Public Key Index, Certificate Serial Numbe					
Default DDOL	Yes	Yes	Yes	Yes	Yes					
Manual act. when CA PK loading fails	Yes	Yes	Yes	Yes	Yes					
CA PK verified with check sum	No	No	No	No	No					
Cardholder Verification Method										
Bypass PIN Entry	Yes	Yes	Yes	Yes	Yes					
Subsequent Bypass PIN Entry	Yes	Yes	Yes	Yes	Yes					
Get Data for PIN Try Counter	Yes	Yes	Yes	Yes	Yes					
Fail CVM	Yes	Yes	Yes	Yes	Yes					
Amount known before CVM proces.	Yes	Yes	Yes	Yes	Yes					
Terminal Risk Management										
Floor Limit Checking	Yes	Yes	Yes	Yes	Yes					
Random Transaction Selection	Yes	Yes	Yes	Yes	Yes					
Velocity Checking	Yes	Yes	Yes	Yes	Yes					
Transaction Log	Yes	Yes	Yes	Yes	Yes					
Exception File	No	No	No	No	No					
TRM irrespective of AIP setting (expected behavior)	Yes	Yes	Yes	Yes	Yes					
Terminal Action Analysis										
Terminal Action Codes supported	Yes	Yes	Yes	Yes	Yes					
TAC can be changed	Yes	Yes	Yes	Yes	Yes					
TAC can be deleted or disabled	No	No	No	No	No					
How does offline only Terminal process Default Action Codes?	N/A	N/A	N/A	N/A	N/A					
How does online only terminal process TAC/IAC-Default when unable to go online?	Normal	Normal	Normal	Normal	Normal					

(continued)	1C	2C	3C	4C	5C					
Completion Processing										
Forced Online	Yes	Yes	Yes	Yes	Yes					
Forced Acceptance	No	No	No	No	No					
Advices	Yes	Yes	Yes	Yes	Yes					
Issuer Referrals	Yes	Yes	Yes	Yes	Yes					
Batch Data Capture	Yes	Yes	Yes	Yes	Yes					
Online Data Capture	Yes	Yes	Yes	Yes	Yes					
Default TDOL	Yes	Yes	Yes	Yes	Yes					
Exception Handling										
POS Entry Mode	92	92	92	92	92					
Miscellaneous										
PIN Pad	No	No	Yes	Yes	No					
Amount and PIN on same keypad	Yes	Yes	No	No	Yes					
ICC/Magstripe Reader Combined	No	No	No	No	No					
If Combined, is Magstripe read first?	No	No	No	No	No					
Supports account type selection	No	No	No	No	No					
Supports 'on fly' script processing	No	No	No	No	No					
Issuer Script device limit > 128 bytes	Yes	Yes	Yes	Yes	Yes					
If limit > 128, value supported?	256	256	256	256	256					
Internal Date Management	Yes	Yes	Yes	Yes	Yes					
Does the terminal support Receipt?	Yes	Yes	Yes	Yes	Yes					

Attachment 1

Specific Terms and Conditions to the Letter of Approval

Restriction:

None