April 21, 2017

Igor Soukhostavsky

TT, Ltd (Terminal Technologies)

8 Yunosty

Zelenograd

Moscow 124482

RUSSIAN FEDERATION

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

EMV Application Kernel:	**emvlib Version 1.7**
Approval Number(s):	**2-03935-1-1C-ULVS-0417-4.3.e**
	2-03935-1-2C-ULVS-0417-4.3.e
	2-03935-1-3C-ULVS-0417-4.3.e
	2-03935-1-4C-ULVS-0417-4.3.e
	2-03935-1-1OS-ULVS-0417-4.3.e

The EMV Application Kernel has been tested on the following terminal

Terminal:	**YARUS P2100**
PinPad:	**n/a**
Operating System:	**1OS = Linux Version 2.6**

Renewal Date: **12-Apr-2020**

Report ID   Session 1: **2 TETE-RP11630342JD01A-ULVS - UL VS Ltd**

Kernel Checksum:

EB29EFD3

Configurations Checksums:

Config	Vendor Config ID	Terminal	Checksum
1C	POS	22	5CD62DAB
2C	UPT-1 (K2100)	25	04A1EFBD
3C	UPT-2 (VTEK1)	25	0C0F6EBD
4C	UPT-3 (VTEK2)	25	39E4C48F

Dear Igor Soukhostavsky:

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 refered 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.

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 Chair

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						
Card Data Input Capability										
Terminal Type	22	25	25	25						
Manual Key Entry	Yes	No	No	No						
Magnetic Stripe	Yes	Yes	Yes	Yes						
IC with Contacts	Yes	Yes	Yes	Yes						
CVM Capability										
Plaintext PIN	Yes	No	No	Yes						
Online Enciphered PIN	Yes	Yes	No	Yes						
Signature (Paper)	Yes	No	No	No						
Offline Enciphered PIN	Yes	No	No	Yes						
No CVM	Yes	Yes	Yes	Yes						
Security Capability										
SDA & DDA	Yes	Yes	Yes	Yes						
Card Capture	No	No	No	No						
CDA	Mode 1	Mode 1	Mode 1	Mode 1						
Transaction Type Capability										
Tran Type - Cash	Yes	Yes	Yes	Yes						
Tran Type - Goods	Yes	Yes	Yes	Yes						
Tran Type - Services	Yes	Yes	Yes	Yes						
Tran Type - Cash Back	Yes	No	No	No						
Tran Type - Inquiry	Yes	Yes	Yes	Yes						
Tran Type - Transfer	Yes	Yes	Yes	Yes						
Tran Type - Payment	Yes	Yes	Yes	Yes						
Tran Type - Admin	Yes	Yes	Yes	Yes						
Tran Type - Cash Deposit	Yes	Yes	Yes	Yes						
Terminal Data Input Capability										
Keypad	Yes	Yes	Yes	Yes						
Numeric Keys	Yes	Yes	No	Yes						
Alpha and Special Character Keys	Yes	Yes	No	Yes						
Command Keys	Yes	Yes	No	Yes						
Function Keys	Yes	Yes	Yes	Yes						
Terminal Data Output Capability										
Print, Attendant	Yes	No	No	No						
Print, Cardholder	No	Yes	No	No						
Display, Attendant	Yes	No	No	No						
Display, Cardholder	No	Yes	Yes	Yes						
Code Table 10	No	No	No	No						
Code Table 9	No	No	No	No						
Code Table 8	No	No	No	No						
Code Table 7	No	No	No	No						
Code Table 6	No	No	No	No						
Code Table 5	No	No	No	No						
Code Table 4	No	No	No	No						
Code Table 3	No	No	No	No						
Code Table 2	No	No	No	No						
Code Table 1	Yes	Yes	Yes	Yes						

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

(continued)	1C	2C	3C	4C						
Completion Processing										
Forced Online	Yes	Yes	Yes	Yes						
Forced Acceptance	Yes	Yes	Yes	Yes						
Advices	Yes	Yes	Yes	Yes						
Issuer Referrals	Yes	No	No	No						
Batch Data Capture	Yes	Yes	Yes	Yes						
Online Data Capture	Yes	Yes	Yes	Yes						
Default TDOL	Yes	Yes	Yes	Yes						
Exception Handling										
POS Entry Mode	80	80	80	80						
Miscellaneous										
PIN Pad	Yes	Yes	No	Yes						
Amount and PIN on same keypad	Yes	Yes	Yes	Yes						
ICC/Magstripe Reader Combined	No	Yes	Yes	No						
If Combined, is Magstripe read first?	No	No	No	n/a						
Supports account type selection	Yes	Yes	Yes	Yes						
Supports 'on fly' script processing	No	No	No	No						
Issuer Script device limit > 128 bytes	Yes	Yes	Yes	Yes						
If limit > 128, value supported?	256	256	256	256						
Internal Date Management	Yes	Yes	Yes	Yes						
Does the terminal support Receipt?	Yes	Yes	No	No						

Attachment 1
Specific Terms and Conditions to the Letter of Approval

Restriction:

None