

**NEW POS Technology Limited**  
**EMV Level2 Kernel-C SDK User Manual**  
**V1.7**

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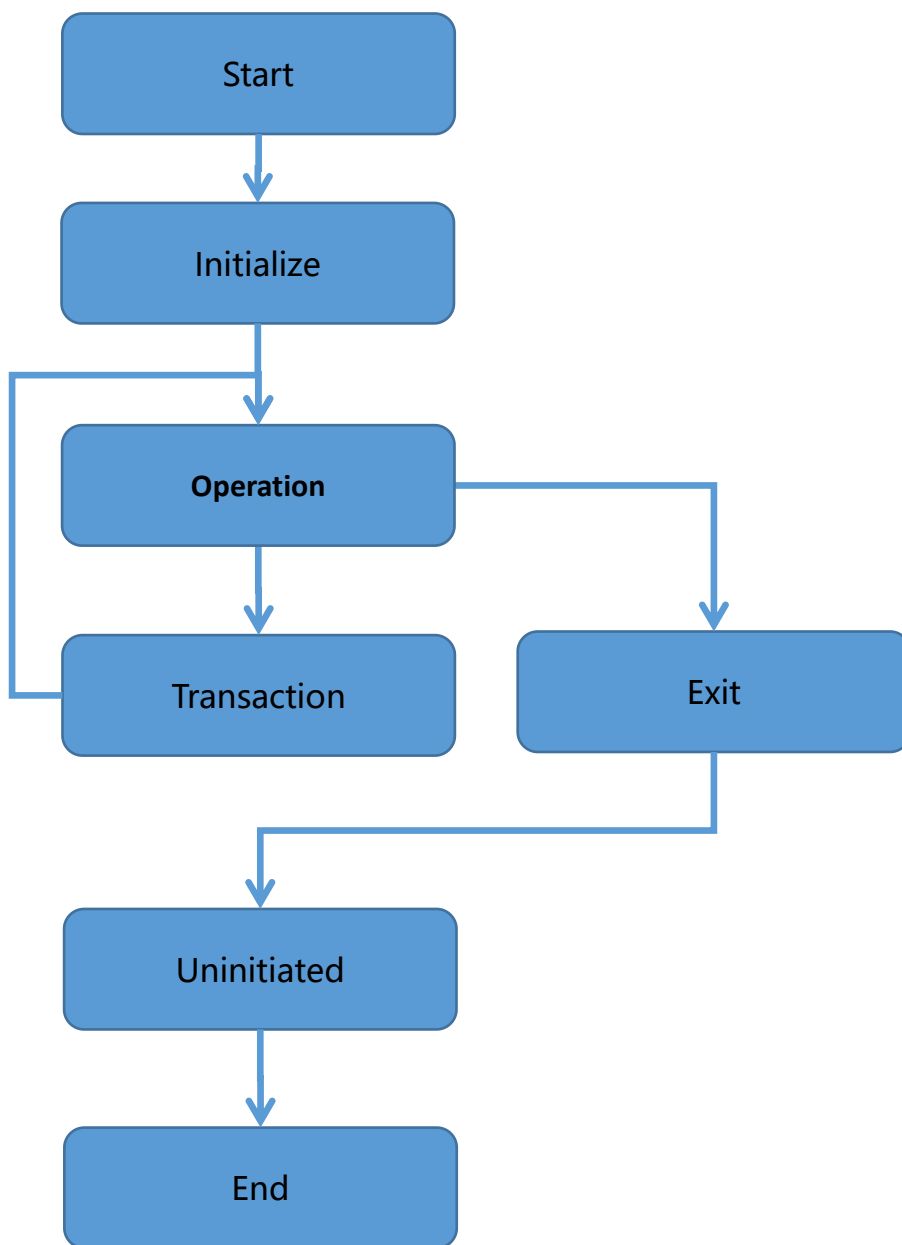
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## Document History

Version	Update Date	Author	Descriptions
V1.0	2019/4/11	Harrison Lee	Draft
V1.1	2019/6/5	Harrison Lee	Add callback function for the PAN check.
V1.2	2019/10/28	Harrison Lee	Add "param" other to Application selection callback function
V1.3	2020/5/26	Bin.Dai	Update Kernel parameter Update EP interface and callback function declaration
V1.4	2020/10/09	Bin.Dai	Add EFTPOS kernel parameter
V1.5	2021/4/13	Harrison Lee	Add Interac kernel parameter
V1.6	2021/4/23	Bin Dai	Add JCB kernel parameter Update Contactless API
V1.7	2021/8/13	Liwuzhi	Add WISE kernel parameter
V1.7	2023/11/3	ZongKang	Add QPBOC kernel parameter

# 1. Instructions

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## 1.1. Initialize

Process	description
EMV_CALLBACKS_T    callbacks EMV_FRAME_WORK    fw; EMV_ENTRY_POINT   ep ;	Define several variable callbacks, fw, ep.
Step1: cb_callbacks_get(exe, &callbacks);	Initiation callbacks, Get callback function pointer
Step2: fw = emv_fw_init(&callbacks);	Initiation fw pointer
Step3: if(fw != NULL) ep = emv_ep_init(fw);	Initiation ep pointer
Step4: load the kernel function by emv_ep_kernel_load().	Load the kernel function to ep->m_kernels list
Step5: load kernel parameter emv_ep_kernel_param_set(ep, param, param_len);	
Step5: if above all is success, start transaction	Start transaction process
<b>Note: if have any failed on above, exit program at once.</b>	

## 1.2. Transaction process

### 1.2.1. Contact Transaction process

Process	description
Step1: Initiation process emv_error_indication_init(); emv_outcome_param_init(); emv_user_interface_reqeust_data_in it();	Initiation process
Step2: emv_ep_pre_transaction()	Previous process before start transaction
Step3: Polling card	
Step4: emv_ep_contact_build_candidate_list(ep, EMV_FALSE, EMV_TRUE);	Build application candidate list
Step5:emv_ep_contact_application_select (ep);	Select application
Step6:emv_ep_contact_initiate_applicatio n(ep)	Initiation application(GPO)
Step6:emv_ep_contact_read_application_ data(ep)	Read application data(read record)



Step7:emv_ep_contact_data_authentication(ep)	Offline data authentication(SDA or DDA or CDA)
Step8:emv_ep_contact_process_restriction(ep)	Restriction process(check application version, application effective&expired date check)
Step8:emv_ep_contact_cardholder_verification(ep)	CVM perform
Step9:emv_ep_contact_terminal_risk_management(ep)	Terminal risk management
Step10:emv_ep_contact_terminal_action_analysis(ep)	Terminal action analyze, according to previous process outcome to decide terminal decline or approve the transaction
Step10:emv_ep_contact_card_action_analysis(ep)	Card action analyze,according to terminal's process outcome, card to decide the transaction should be approved, declined or online process.
Step11: if above process outcome is online  Emv_ep_contact_completion(ep) Else goto step12	if card decide online, terminal processing online and then complete transaction
Step12: end transaction	Close polling card Display transaction outcome

### 1.2.2. Contactless Transaction Process

Process	description
Step1: Initiation process emv_error_indication_init(); emv_outcome_param_init(); emv_user_interface_request_data_init();	Initiation process
Step2: emv_ep_pre_transaction()	Previous process before start transaction
Step3: Polling card	
Step4: emv_ep_contactless_build_combination()	Build application candidate list
Step5: emv_ep_contactless_transaction()	Contactless transaction process
Step6: if above process outcome is online auth. emv_ep_contactless_transaction_completion() Else goto step7	if card decide online, terminal processing online and then complete transaction
Step7: end transaction	Close polling card

	Display transaction outcome

### 1.3. Uninitiated

Process	description
Step1: emv_ep_free(exe->ep);	Free the ep point memory
Step2: emv_fw_free(exe->fw);	Free the fw point memory

## 2. Framework

### 2.1. Callback Functions

#### 2.1.1. FN\_CB\_LOG\_ENTER

<b>Prototype</b>	typedef EMV_VOID (*FN_CB_LOG_ENTER) (EMV_PROGRAM callback_program)	
<b>Description</b>	print the log for enter(Each time the print message is called, it is indented backwards)	
<b>Parameters</b>	callback_program	Handle of void *
<b>Return Value</b>	None	
<b>Example</b>		

#### 2.1.2. FN\_CB\_LOG\_LEAVE

<b>Prototype</b>	typedef EMV_VOID (*FN_CB_LOG_LEAVE) (EMV_PROGRAM callback_program)	
<b>Description</b>	print the log for leave(Each time the print message is called, it is indented cancel)	
<b>Parameters</b>	callback_program	Handle of void *
<b>Return Value</b>	None	

<b>Example</b>	
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### 2.1.3. FN\_CB\_LOG\_PRINTF

<b>Prototype</b>	typedef EMV_VOID (*FN_CB_LOG_PRINTF) ( EMV_PROGRAM callback_program, EMV_CHAR_CPTR fmt,...)	
<b>Description</b>	print the log	
<b>Parameters</b>	callback_program	Handle of void *
	fmt	
<b>Return Value</b>	None	
<b>Example</b>		

### 2.1.4. FN\_CB\_LOG\_PRINT\_MEMORY

<b>Prototype</b>	Typedef EMV_VOID (*FN_CB_LOG_PRINT_MEMORY) ( EMV_PROGRAM callback_program, EMV_CHAR_CPTR fmt, EMV_VOID_CPTR data, EMV_UINT data_len)	
<b>Description</b>	printf the log for memory	
<b>Parameters</b>	callback_program g fmt	Handle of void *
	data[in]	Data need to print
	data_len[in]	Data length
<b>Return Value</b>	None	
<b>Example</b>		

### 2.1.5. FN\_CB\_SYS\_IFD\_SERIAL\_NUMBER\_GET

<b>Prototype</b>	typedef EMV_BOOL (*FN_CB_SYS_IFD_SERIAL_NUMBER_GET) ( EMV_PROGRAM callback_program, EMV_CHAR_PTR buff, EMV_UINT buff_size);
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<b>Description</b>	Get the terminal serial number	
<b>Parameters</b>	callback_program[in]	Handle of void *
	buff[out]	The function fill the serial number to buff
	buff_size[in]	Size of the buff
<b>Return Value</b>	EMV_TRUE:Succeed EMV_FAISE:false	
<b>Example</b>		

## 2.1.6. FN\_CB\_SYS\_CURRENT\_TIME\_GET

<b>Prototype</b>	typedef EMV_BOOL (*FN_CB_SYS_CURRENT_TIME_GET) (EMV_PROGRAM callback_program, EMV_TIME_PTR current_time);	
<b>Description</b>	Get the terminal serial number	
<b>Parameters</b>	callback_program[in]	Handle of void *
	current_time[out]	The function fill the current time to buff. typedef struct { EMV_UINT m_year; EMV_UINT m_month; EMV_UINT m_day; EMV_UINT m_hour; EMV_UINT m_minute; EMV_UINT m_second; } EMV_TIME_T; typedef EMV_TIME_T * EMV_TIME_PTR;
<b>Return Value</b>	EMV_TRUE:Succeed EMV_FAISE:false	
<b>Example</b>		

## 2.1.7. FN\_CB\_SYS\_GET\_TIMESTAMP

<b>Prototype</b>	typedef EMV_VOID (*FN_CB_SYS_GET_TIMESTAMP) (EMV_PROGRAM exe, EMV_TIMESTAMP_PTR timeStamp)	
<b>Description</b>	Get the terminal serial number	
<b>Parameter</b>	callback_pro	Handle of void *

<b>s</b>	gram[in]	
	timeStamp[out]	Get the time stamp. typedef struct{ EMV_TICKCOUNT m_second; EMV_TICKCOUNT m_usecond; }EMV_TIMESTAMP_T, * EMV_TIMESTAMP_PTR;
<b>Return Value</b>	None	
<b>Example</b>		

## 2.1.8. FN\_CB\_SYS\_MSLEEP

<b>Prototype</b>	typedef EMV_VOID (*FN_CB_SYS_MSLEEP) ( EMV_PROGRAM callback_program, EMV_UINT mseconds)	
<b>Description</b>		
<b>Parameters</b>	callback_program[in]	Handle of void *
	mseconds[in]	Delay time (ms)
<b>Return Value</b>	None	
<b>Example</b>		

## 2.1.9. FN\_CB\_SYS\_TRANS\_SEQ\_NUMBER

<b>Prototype</b>	typedef EMV_VOID (*FN_CB_SYS_TRANS_SEQ_NUMBER) ( EMV_PROGRAM callback_program, EMV_UINT_PTR trans_seq_number)	
<b>Description</b>	Get the transaction seq number	
<b>Parameters</b>	callback_program[in]	Handle of void *
	trans_seq_number[out]	The transaction seq number fill to trans_seq_number
<b>Return Value</b>	None	
<b>Example</b>		

### 2.1.10. FN\_CB\_SYS\_TRANS\_AMOUNT\_TOTAL\_GET

<b>Prototype</b>	<pre>typedef EMV_VOID (*FN_CB_SYS_TRANS_AMOUNT_TOTAL_GET) (     EMV_PROGRAM callback_program,     EMV_BYTE_CPTR pan,     EMV_UINT pan_len,     EMV_BYTE_CPTR seq,     EMV_UINT seq_len,     EMV_AMOUNT_PTR total_amount);</pre>	
<b>Description</b>	get the transaction data for total amount pan and seq.	
<b>Parameters</b>	callback_program[in]	Handle of void *
	pan[in]	Primary account number(tag:5A)
	pan_len[in]	Length of pan
	seq[in]	Primary account number sequence(tag: 5F34)
	seq_len[in]	Length of seq
	total_amount[out]	Buff of store the amount, typedef EMV_AMOUNT *EMV_AMOUNT_PTR;
<b>Return Value</b>	None	
<b>Example</b>		

### 2.1.11. FN\_CB\_SYS\_BREAK\_DETECT

<b>Prototype</b>	<pre>typedef EMV_BREAK_SOURCE (*FN_CB_SYS_BREAK_DETECT) (     EMV_PROGRAM callback_program)</pre>	
<b>Description</b>	Break the Contactless transaction, check for contact and magnetic stripe	
<b>Parameters</b>	callback_program[in]	Handle of void *
<b>Return Value</b>	Return the break source. <pre>typedef enum {     BREAK_NONE,     BREAK_BY_CONTACT, //contact card     BREAK_BY_SWIPE,   //Magnetic stripe card     BREAK_BY_CANCEL   //Cancel } EMV_BREAK_SOURCE;</pre>	

<b>Example</b>	
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## 2.1.12. FN\_CB\_HSM\_RANDOM\_NUMBER\_GET

<b>Prototype</b>	typedef EMV_BOOL (*FN_CB_HSM_RANDOM_NUMBER_GET) (EMV_PROGRAM callback_program, EMV_VOID_PTR buff, EMV_UINT len);	
<b>Description</b>	Get the terminal random number	
<b>Parameters</b>	callback_program[in]	Handle of void *
	buff[out]	The random number fill to buff.
	len[in]	Size of the buff
<b>Return Value</b>	EMV_TRUE:Succeed EMV_FALSE:false	
<b>Example</b>		

## 2.1.13. FN\_CB\_HSM\_SHA1\_INIT

<b>Prototype</b>	typedef EMV_BOOL (*FN_CB_HSM_SHA1_INIT) (EMV_PROGRAM callback_program, EMV_SHA1_CTX ctx)	
<b>Description</b>	Initialization the hash data for sha1	
<b>Parameters</b>	callback_program[in]	Handle of void *
	ctx[out]	typedef EMV_BYTE EMV_SHA1_CTX[200];
<b>Return Value</b>	EMV_TRUE:Succeed EMV_FALSE:false	
<b>Example</b>		

## 2.1.14. FN\_CB\_HSM\_SHA1\_UPDATE

<b>Prototype</b>	typedef EMV_VOID (*FN_CB_HSM_SHA1_UPDATE) (EMV_PROGRAM callback_program, EMV_SHA1_CTX ctx, EMV_VOID_CPTR data, EMV_UINT data_len)	
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<b>Description</b>	update the hash data for sha1	
<b>Parameters</b>	callback_program[in]	Handle of void *
	ctx[out]	SHA1 context
	data[in]	Data need to do SHA1 calculation
	data_len[in]	Length of data
<b>Return Value</b>	None	
<b>Example</b>		

### 2.1.15. FN\_CB\_HSM\_SHA1\_FINAL

<b>Prototype</b>	<pre>typedef EMV_VOID (*FN_CB_HSM_SHA1_FINAL) (     EMV_PROGRAM callback_program,     EMV_SHA1_CTX ctx,     EMV_BYTE hash[20]);</pre>	
<b>Description</b>	Final the hash data for sha1	
<b>Parameters</b>	callback_program[in]	Handle of void *
	ctx[in]	SHA1 context
	Hash[out]	Return the final hash data to hash.
<b>Return Value</b>	None	
<b>Example</b>		

### 2.1.16. FN\_CB\_HSM\_SM3\_INIT

<b>Prototype</b>	<pre>typedef EMV_BOOL (*FN_CB_HSM_SM3_INIT) (     EMV_PROGRAM callback_program,     EMV_SM3_CTX ctx);</pre>	
<b>Description</b>	Init the hash data for SM3	
<b>Parameters</b>	callback_program[in]	Handle of void *
	ctx[out]	typedef EMV_BYTE EMV_SM3_CTX[300];
<b>Return Value</b>	EMV_TRUE:succeed EMV_FALSE:false	



<b>Example</b>	
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### 2.1.17. FN\_CB\_HSM\_SM3\_UPDATE

<b>Prototype</b>	<pre>typedef EMV_VOID (*FN_CB_HSM_SM3_UPDATE) (     EMV_PROGRAM callback_program,     EMV_SM3_CTX ctx,     EMV_VOID_CPTR data,     EMV_UINT data_len);</pre>	
<b>Description</b>	Update the hash data for SM3	
<b>Parameters</b>	callback_program[in]	Handle of void *
	ctx[out]	SM3 context
	data[in]	Data need to do SM3 calculation.
	data_len[in]	Length of data.
<b>Return Value</b>	None	
<b>Example</b>		

### 2.1.18. FN\_CB\_HSM\_SM3\_FINAL

<b>Prototype</b>	<pre>typedef EMV_VOID (*FN_CB_HSM_SM3_FINAL) (     EMV_PROGRAM callback_program,     EMV_SM3_CTX ctx,     EMV_BYTE hash[32]);</pre>	
<b>Description</b>	Final the hash data for SM3	
<b>Parameters</b>	callback_program[in]	Handle of void *
	ctx[in]	SM3 context
	Hash[out]	Return the final hash data to hash
<b>Return Value</b>	None	
<b>Example</b>		

### 2.1.19. FN\_CB\_HSM\_DES\_ENCRYPT

<b>Prototype</b>	<pre>typedef EMV_BOOL (*FN_CB_HSM_DES_ENCRYPT) (</pre>
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	<pre> EMV_PROGRAM callback_program, EMV_DES_MODE mode, EMV_BYTE_CPTR key, EMV_UINT key_len, EMV_BYTE_CPTR data_in, EMV_UINT data_in_len, EMV_BYTE_PTR data_out ); </pre>	
<b>Description</b>	Encrypt data by the DES algorithm	
<b>Parameters</b>	callback_program[in]	Handle of void *
	mode[in]	The mode required for encryption
	key[in]	The key required for encryption
	key_len[in]	The key length
	data_in[in]	Data need to DES encrypt.
	data_in_len[in]	Data length.
	data_out[out]	Data of encrypted for DES.
<b>Return Value</b>	EMV_TRUE:succeed EMV_FALSE:failed	
<b>Example</b>		

## 2.1.20. FN\_CB\_HSM\_DES\_DECRYPT

<b>Prototype</b>	<pre> typedef EMV_BOOL (*FN_CB_HSM_DES_DECRYPT) ( EMV_PROGRAM callback_program, EMV_DES_MODE mode, EMV_BYTE_CPTR key, EMV_UINT key_len, EMV_BYTE_CPTR data_in, EMV_UINT data_in_len, EMV_BYTE_PTR data_out ) </pre>	
<b>Description</b>	Decrypt data by the DES algorithm	
<b>Parameters</b>	callback_program[in]	Handle of void *
	mode[in]	The mode required for decrypt
	key[in]	The key required for decrypt
	key_len[in]	The key length

	data_in[in]	Data need to DES decrypt
	data_in_len[in]	Data length
	data_out[out]	Data of decrypt for DES.
<b>Return Value</b>	EMV_TRUE:succeed EMV_FALSE:failed	
<b>Example</b>		

### 2.1.21. FN\_CB\_HSM\_AES\_ENCRYPT

<b>Prototype</b>	<pre> Typedef EMV_BOOL  (*FN_CB_HSM_AES_ENCRYPT) ( EMV_PROGRAM callback_program, EMV_AES_MODE  mode, EMV_BYTE_CPTR key, EMV_UINT      key_len, EMV_BYTE_CPTR data_in, EMV_UINT      data_in_len, EMV_BYTE_PTR  data_out ) </pre>	
<b>Description</b>	Encrypt data by the AES algorithm	
<b>Parameters</b>	callback_program[in]	Handle of void *
	mode[in]	The mode required for decrypt
	key[in]	The key required for decrypt
	key_len[in]	The key length
	data_in[in]	Data need to do AES encrypt
	data_in_len[in]	Data length
	data_out[out]	Data of encrypted for AES
<b>Return Value</b>	EMV_TRUE:succeed EMV_FALSE:failed	
<b>Example</b>		

## 2.1.22. FN\_CB\_HSM\_AES\_DECRYPT

<b>Prototype</b>	<pre> typedef EMV_BOOL  (*FN_CB_HSM_AES_ENCRYPT) (     EMV_PROGRAM callback_program,     EMV_AES_MODE   mode,     EMV_BYTE_CPTR  key,     EMV_UINT       key_len,     EMV_BYTE_CPTR  data_in,     EMV_UINT       data_in_len,     EMV_BYTE_PTR   data_out ) </pre>	
<b>Description</b>	Encrypt data by the AES algorithm	
<b>Parameters</b>	callback_program[in]	Handle of void *
	Mode[in]	The mode required for decrypt
	Key[in]	The key required for decrypt
	key_len[in]	The key length
	data_in[in]	Data need to do decrypt for AES
	data_in_len[in]	Length of data
	data_out[out]	Data of decrypt for AES.
<b>Return Value</b>	EMV_TRUE:succeed EMV_FALSE:failed	
<b>Example</b>		

## 2.1.23. FN\_CB\_HSM\_RSA\_PUBLIC\_ENCRYPT

<b>Prototype</b>	<pre> typedef EMV_BOOL  (*FN_CB_HSM_RSA_PUBLIC_ENCRYPT) (     EMV_PROGRAM callback_program,     EMV_BYTE_CPTR modules,     EMV_UINT modules_len,     EMV_BYTE_CPTR exponents,     EMV_UINT exponents_len,     EMV_BYTE_CPTR data_in,     EMV_UINT data_in_len,     EMV_BYTE_PTR  data_out,     EMV_UINT_PTR  data_out_len); </pre>	
<b>Description</b>	Encrypt data by the RSA algorithm	

<b>Parameters</b>	callback_program[in]	Handle of void *
	mode[in]	The mode required for decrypt
	modules_len[in]	The modules length
	key[in]	The key required for decrypt
	key_len[in]	The key length
	data_in[in]	Input data
	data_in_len[in]	Input data length
	data_out[in]	Output data
	data_out_len[in]	Output data length
<b>Return Value</b>	EMV_TRUE:succeed EMV_FALSE:failed	
<b>Example</b>		

## 2.1.24. FN\_CB\_HSM\_RSA\_PRIVATE\_DECRYPT

<b>Prototype</b>	<pre>typedef EMV_BOOL (*FN_CB_HSM_RSA_PRIVATE_DECRYPT) (     EMV_PROGRAM callback_program,     EMV_BYTE_CPTR modules,     EMV_UINT modules_len,     EMV_BYTE_CPTR private_exponents,     EMV_UINT private_exponents_len,     EMV_BYTE_CPTR public_exponents,     EMV_UINT public_exponents_len,     EMV_BYTE_CPTR data_in,     EMV_UINT data_in_len,     EMV_BYTE_PTR data_out,     EMV_UINT_PTR data_out_len)</pre>	
<b>Description</b>	Decrypt data by the RSA algorithm	
<b>Parameters</b>	callback_program[in]	Handle of void *
	mode[in]	The mode required for decrypt
	modules_len[in]	The modules length
	key[in]	The key required for decrypt
	key_len[in]	The key length
	data_in[in]	Input data
	data_in_len[in]	Input data length

	in]	
	data_out[in]	Output data
	data_out_len[in]	Output data length
<b>Return Value</b>	EMV_TRUE:succeed EMV_FALSE:failed	
<b>Example</b>		

## 2.1.25. FN\_CB\_HSM\_SM2\_GET\_ZA

<b>Prototype</b>	typedef EMV_VOID(*FN_CB_HSM_SM2_GET_ZA)(EMV_PROGRAM exe, const EMV_BYTE pk_x[32], const EMV_BYTE pk_y[32], unsigned char za[32]);	
<b>Description</b>	SM2, get ZA	
<b>Parameters</b>	callback_program[in]	Handle of void *
	pk_x[in]	
	pk_y[in]	
	za[out]	Output data
<b>Return Value</b>	None	
<b>Example</b>		

## 2.1.26. FN\_CB\_HSM\_SM2\_VERIFY

<b>Prototype</b>	typedef EMV_BOOL (*FN_CB_HSM_SM2_VERIFY) ( EMV_PROGRAM callback_program, const EMV_BYTE pk_x[32], const EMV_BYTE pk_y[32], const EMV_BYTE digit[32], const EMV_BYTE r[32], const EMV_BYTE s[32])	
<b>Description</b>	Verify the data to RSA algorithm	
<b>Parameters</b>	callback_program[in]	Handle of void *
	pk_x[in]	

	pk_y[in]	
	digit[in]	
	r[in]	
	s[in]	
<b>Return Value</b>	EMV_TRUE:succeed EMV_FALSE:failed	
<b>Example</b>		

## 2.1.27. FN\_CB\_CT\_APDU\_EXCHANGE

<b>Prototype</b>	typedef EMV_BOOL (*FN_CB_CT_APDU_EXCHANGE) ( EMV_PROGRAM callback_program, EMV_BYTE_CPTR apdu, EMV_UINT apdu_len, EMV_BYTE_PTR resp, EMV_UINT_PTR resp_len)	
<b>Description</b>	The APDU exchange to contact	
<b>Parameters</b>	callback_program[in]	Handle of void *
	apdu[in]	Send the data to card
	apdu_len[in]	The data length of send
	resp[out]	The data return by the card
	resp_len[out]	The data length of card response
<b>Return Value</b>	EMV_TRUE:succeed EMV_FALSE:failed	
<b>Example</b>		

## 2.1.28. FN\_CB\_CL\_APDU\_EXCHANGE

<b>Prototype</b>	typedef EMV_BOOL (*FN_CB_CL_APDU_EXCHANGE) ( EMV_PROGRAM callback_program, EMV_BYTE_CPTR apdu, EMV_UINT apdu_len, EMV_BYTE_PTR resp, EMV_UINT_PTR resp_len);	
<b>Description</b>	The APDU exchange to Contactless.	
<b>Parameter</b>	callback_pro	Handle of void *

<b>s</b>	gram[in]	
	apdu[in]	Send the data to card
	apdu_len[in]	The data length of send
	resp[out]	The data return by the card
	resp_len[out] ]	The data length of card response.
<b>Return Value</b>	EMV_TRUE:succeed EMV_FALSE:failed	
<b>Example</b>		

### 2.1.29. FN\_CB\_CL\_APDU\_SEND

<b>Prototype</b>	typedef EMV_BOOL (*FN_CB_CL_APDU_SEND) ( EMV_PROGRAM callback_program, EMV_BYTE_CPTR apdu, EMV_UINT apdu_len);	
<b>Description</b>	The Contactless send APDU to card.	
<b>Parameters</b>	callback_program[in]	Handle of void *
	apdu[in]	Send the data to card
	apdu_len[in]	Data length
<b>Return Value</b>	EMV_TRUE:succeed EMV_FALSE:failed	
<b>Example</b>		

### 2.1.30. FN\_CB\_CL\_APDU\_RESP\_GET

<b>Prototype</b>	typedef EMV_BOOL (*FN_CB_CL_APDU_RESP_GET) ( EMV_PROGRAM callback_program, EMV_BOOL_PTR isdone, EMV_BYTE_PTR resp, EMV_UINT_PTR resp_len)	
<b>Description</b>	The Contactless response card APDU reply data.	
<b>Parameters</b>	callback_program[in]	Handle of void *
	isdone[out]	Flag to send complete.
	resp[out]	Card response data
	resp_len[out]	Data length



	]	
<b>Return Value</b>	EMV_TRUE:succeed EMV_FALSE:failed	
<b>Example</b>		

### 2.1.31. FN\_CB\_APP\_PARAM\_COUNT\_GET

<b>Prototype</b>	<pre> Typedef EMV_BOOL (*FN_CB_APP_PARAM_COUNT_GET) (     EMV_PROGRAM callback_program,     EMV_UINT_PTR count) </pre>	
<b>Description</b>	Get the app parameter count.	
<b>Parameters</b>	callback_program[in]	Handle of void *
	count[out]	Application parameter count
<b>Return Value</b>	EMV_TRUE:succeed EMV_FALSE:failed	
<b>Example</b>		

### 2.1.32. FN\_CB\_APP\_PARAM\_GET

<b>Prototype</b>	<pre> typedef EMV_BOOL (*FN_CB_APP_PARAM_GET) (     EMV_PROGRAM callback_program,     EMV_UINT app_index,     EMV_KERNEL_ID_PTR kernel_id,     EMV_TRANS_TYPE_PTR trans_type,     EMV_AID aid,     EMV_UINT_PTR aid_len,     EMV_BOOL_PTR asi,     EMV_BYTE_PTR app_param,     EMV_UINT_PTR app_param_len); </pre>	
<b>Description</b>	Get the app parameter data.	
<b>Parameters</b>	callback_program[in]	Handle of void *
	app_index[in]	Index of application parameter
	kernel_id[out]	Kernel id
	trans_type[out]	Transaction type

	ut]	
	aid[out]	Get marched AID buff
	aid_len[out]	AID length
	asi[out]	Weather support partial march
	app_param[out]	Application parameter
	app_param_len[out]	Application parameter length
<b>Return Value</b>	EMV_TRUE:succeed EMV_FALSE:failed	
<b>Example</b>		

### 2.1.33. FN\_CB\_CAPK\_GET

<b>Prototype</b>	<pre>typedef EMV_BOOL (*FN_CB_CAPK_GET) (     EMV_PROGRAM callback_program,     const EMV_BYTE rid[5],     EMV_BYTE data_index,     EMV_PUBLIC_KEY_TYPE type,     EMV_PUBLIC_KEY_PTR key)</pre>	
<b>Description</b>	Get the CAPK data.	
<b>Parameters</b>	callback_program[in]	Handle of void *
	rid[5]	RID
	data_index[in]	CAPK parameter index
	type[in]	EMV_RSA, EMV_SM2
	key[out]	<pre>typedef struct{     EMV_PUBLIC_KEY_TYPE m_key_type;     union{         EMV_PUBLIC_KEY_RSA m_rsa;         EMV_PUBLIC_KEY_SM2 m_sm2;     }; }EMV_PUBLIC_KEY;</pre>
<b>Return Value</b>	EMV_TRUE:succeed EMV_FALSE:failed	
<b>Example</b>		

### 2.1.34. FN\_CB\_IPKC\_REVOCK\_CHECK

<b>Prototype</b>	<pre>typedef EMV_BOOL (*FN_CB_IPKC_REVOCK_CHECK) (     EMV_PROGRAM callback_program,     const EMV_BYTE rid[5],     EMV_BYTE      data_index,     const EMV_BYTE serial_num[3]);</pre>	
<b>Description</b>	Check the issuer public key certification in the recover file.	
<b>Parameters</b>	callback_program[in]	Handle of void *
	rid[in]	RID
	data_index[in]	index
	serial_num[in]	Serial number
<b>Return Value</b>	EMV_TRUE:issuer public key certification has recovered EMV_FALSE:issuer public key certification has not recovered	
<b>Example</b>		

### 2.1.35. FN\_CB\_EXCEPTION\_FILE\_CHECK

<b>Prototype</b>	<pre>typedef EMV_BOOL (*FN_CB_EXCEPTION_FILE_CHECK) (     EMV_PROGRAM callback_program,     EMV_BYTE_CPTR pan,     EMV_UINT pan_len,     EMV_BYTE_CPTR pan_seq,     EMV_UINT pan_seq_len);</pre>	
<b>Description</b>	Check the exception data in the except file.	
<b>Parameters</b>	callback_program[in]	Handle of void *
	pan[in]	Primary account number(tag:5A)
	pan_len[in]	Length of pan
	pan_seq[in]	Primary account number sequence(tag: 5F34)
	pan_seq_len[in]	Length of seq
<b>Return Value</b>	EMV_TRUE: PAN in except file. EMV_FALSE: PAN not in except file.	
<b>Example</b>		

### 2.1.36. FN\_CB\_UI\_DISPLAY\_PROCESSING

<b>Prototype</b>	typedef EMV_VOID (*FN_CB_UI_DISPLAY_PROCESSING) (EMV_PROGRAM callback_program);	
<b>Description</b>	Displayed the "PROCESSING..." on the scan.	
<b>Parameters</b>	callback_program[in]	Handle of void *
<b>Return Value</b>	None	
<b>Example</b>		

### 2.1.37. FN\_CB\_UI\_APPLICATION\_SELECT

<b>Prototype</b>	typedef EMV_BOOL (*FN_CB_UI_APPLICATION_SELECT) (EMV_PROGRAM callback_program, EMV_BOOL contactless, EMV_UINT app_count, EMV_KERNEL_ID_CPTR kernels, EMV_CHAR_CPTR aids, EMV_CHAR_CPTR lables, EMV_UINT_CPTR other_tags_len, EMV_BYTE_CPTR other_tags, EMV_UINT_PTR Selected);	
<b>Description</b>	Multiple application card,user selects the trading application.	
<b>Parameters</b>	callback_program[in]	Handle of void *
	Contactless[in]	Whether is Contactless application
	app_count[in]	Application count
	Kernels[in]	NULL
	aids[in]	Application list
	lables[in]	Application label list
	Ohter_tags_len[in]	Length of other tags, no defined in the kernel
	Other_tags[in]	Other tags, no defined in the kernel

	Selected[out ]	Have be selected application
<b>Return Value</b>	EMV_TRUE:succeed EMV_FALSE:failed	
<b>Example</b>		

### 2.1.38. FN\_CB\_UI\_CARDHOLDER\_CONFIRM

<b>Prototype</b>	typedef EMV_BOOL (*FN_CB_UI_CARDHOLDER_CONFIRM) ( EMV_PROGRAM callback_program, EMV_CHAR_CPTR aid, EMV_CHAR_CPTR label)	
<b>Description</b>	Display the aid message and the cardholder confirm the transaction.	
<b>Parameters</b>	callback_program[in]	Handle of void *
	aid[in]	AID
	label[in]	Application label
<b>Return Value</b>	EMV_TRUE:succeed EMV_FALSE:failed	
<b>Example</b>		

### 2.1.39. FN\_CB\_UI\_LANGUAGE\_SELECT

<b>Prototype</b>	typedef EMV_BOOL (*FN_CB_UI_LANGUAGE_SELECT) ( EMV_PROGRAM callback_program, EMV_CHAR_CPTR languages);	
<b>Description</b>	Cardholder select the transaction language	
<b>Parameters</b>	callback_program[in]	Handle of void *
	Languages[in ]	Language list
<b>Return Value</b>	EMV_TRUE:succeed EMV_FALSE:failed	
<b>Example</b>		

## 2.1.40. FN\_CB\_UI\_CREDENTIALS\_CHECK

<b>Prototype</b>	typedef EMV_BOOL (*FN_CB_UI_CREDENTIALS_CHECK) ( EMV_PROGRAM callback_program, EMV_BYTE type, EMV_CHAR_CPTR number, EMV_BOOL_PTR Confirmed)	
<b>Description</b>	Check the credentials	
<b>Parameters</b>	callback_program[in]	Handle of void *
	type[in]	The credentials type
	number[in]	credentials number string
	Confirmed[out]	Indicate confirmed or Cancel
<b>Return Value</b>	EMV_TRUE:confirmed EMV_FALSE:cancel	
<b>Example</b>		

## 2.1.41. FN\_CB\_UI\_PAN\_CONFIRM

<b>Prototype</b>	typedef EMV_BOOL (*FN_CB_UI_PAN_CONFIRM) ( EMV_PROGRAM callback_program, EMV_CHAR_CPTR pan);	
<b>Description</b>	Display the pan number and ask the operator to confirm the pan number.	
<b>Parameters</b>	callback_program[in]	Handle of void *
	pan[in]	Pan number string
<b>Return Value</b>	EMV_TRUE:confirmed EMV_FALSE:Cancel	
<b>Example</b>		

## 2.1.42. FN\_CB\_PED\_PIN\_VERIFY\_STATUS\_SHOW

<b>Prototype</b>	typedef EMV_BOOL (*FN_CB_PED_PIN_VERIFY_STATUS_SHOW) ( EMV_PROGRAM callback_program, EMV_BOOL verify_success,	
------------------	---	--

	EMV_BYTE pin_try_counter)	
<b>Description</b>	Display the PED pin verify status.	
<b>Parameters</b>	callback_program[in]	Handle of void *
	verify_success[in]	EMV_TRUE: pin Verify Succeed EMV_FALSE: pin verify false
	pin_try_counter[in]	0: pin locked Other: pin counter
<b>Return Value</b>	EMV_TRUE: 0 EMV_FALSE: 1	
<b>Example</b>		

### 2.1.43. FN\_CB\_PED\_PLAINTEXT\_PIN\_VERIFY

<b>Prototype</b>	typedef EMV_BOOL (*FN_CB_PED_PLAINTEXT_PIN_VERIFY) (EMV_PROGRAM callback_program, EMV_BOOL_PTR bypass, EMV_SW_PTR sw);	
<b>Description</b>		
<b>Parameters</b>	callback_program[in]	Handle of void *
	Bypass[out]	EMV_TRUE: no pin entry EMV_FALSE: have pin entry
	sw[out]	pin verify status word
<b>Return Value</b>	EMV_TRUE: succeed EMV_FALSE: failed	
<b>Example</b>		

### 2.1.44. FN\_CB\_PED\_ENCIPHER\_PIN\_VERIFY

<b>Prototype</b>	typedef EMV_BOOL (*FN_CB_PED_ENCIPHER_PIN_VERIFY) (EMV_PROGRAM callback_program, const EMV_BYTE random[8], EMV_BYTE_CPTR modules, EMV_UINT modules_len, EMV_BYTE_CPTR exponents, EMV_UINT exponents_len, EMV_BOOL_PTR bypass,	
------------------	---	--

	EMV_SW_PTR sw)	
<b>Description</b>		
<b>Parameters</b>	callback_program[in]	Handle of void *
	random[in]	Random for encipher
	modules[in]	Modules for encipher
	modules_len[in]	Modules length
	exponents[in]	Exponents for encipher
	exponents_len[in]	Exponents length
	bypass[out]	EMV_TRUE: not pin entry EMV_FALSE: have pin entry
	sw[out]	Pin verify status word.
<b>Return Value</b>	EMV_TRUE: succeed EMV_FALSE: failed	
<b>Example</b>		

## 2.1.45. FN\_CB\_PED\_ONLINE\_PIN\_ENTER

<b>Prototype</b>	typedef EMV_BOOL (*FN_CB_PED_ONLINE_PIN_ENTER) ( EMV_PROGRAM callback_program, EMV_CHAR_CPTR pan, EMV_BOOL_PTR bypass)	
<b>Description</b>		
<b>Parameters</b>	callback_program[in]	Handle of void *
	Pan[in]	
	Bypass[out]	EMV_TRUE: not pin entry EMV_FALSE: have pin entry
<b>Return Value</b>	EMV_TRUE: succeed EMV_FALSE: failed	
<b>Example</b>		

## 2.1.46. FN\_CB\_TORN\_RECORD\_SEND

<b>Prototype</b>	typedef EMV_BOOL (*FN_CB_TORN_RECORD_SEND) (
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	EMV_PROGRAM callback_program, EMV_KERNEL_ID kernel_id, EMV_UINT total, EMV_UINT record_index, EMV_BYTE_CPTR record, EMV_UINT record_len)	
<b>Description</b>	Send the torn record to host	
<b>Parameters</b>	callback_program[in]	Handle of void *
	kernel_id[in]	Kernel ID
	total[in]	Record count of sum
	record_index[in]	Record index
	record[in]	Record buff
	record_len[in]	Record length
<b>Return Value</b>	EMV_TRUE:succeed EMV_FALSE:failed	
<b>Example</b>		

## 2.1.47. FN\_CB\_TORN\_RECORD\_SAVE

<b>Prototype</b>	typedef EMV_BOOL (*FN_CB_TORN_RECORD_SAVE) ( EMV_PROGRAM callback_program, EMV_KERNEL_ID kernel_id, EMV_UINT record_index, EMV_VOID_CPTR record, EMV_UINT record_len)	
<b>Description</b>	Save the torn record to terminal	
<b>Parameters</b>	callback_program[in]	Handle of void *
	kernel_id[in]	Kernel ID
	record_index[in]	Record index
	record[in]	Record buff need to save
	record_len[in]	Record length
<b>Return</b>	EMV_TRUE:succeed	

<b>Value</b>	EMV_FALSE:failed
<b>Example</b>	

## 2.1.48. FN\_CB\_DEK\_SEND

Prototype	typedef EMV_BOOL(*FN_CB_DEK_SEND) ( EMV_PROGRAM callback_program, EMV_KERNEL_ID kernel_id, EMV_BYTE_CPTR data, EMV_UINT data_len)		
Description	Send the DEK data to host		
Parameters	callback_program[in]	Handle of void *	
	kernel_id[in]	Kernel ID	
	data[in]	Data to send	
	data_len[in]	Data length	
Return Value	EMV_TRUE:succeed EMV_FALSE:failed		
Example			

## 2.1.49. FN\_CB\_DET\_GET

Prototype	typedef EMV_BOOL(*FN_CB_DET_GET) ( EMV_PROGRAM callback_program, EMV_KERNEL_ID kernel_id, EMV_BYTE_PTR data, EMV_UINT_PTR data_len)	
Description	Get the DET data from host	
Parameters	callback_program[in]	Handle of void *
	kernel_id[in] ]	Kernel ID
	data[out]	The buff to store DET data
	data_len[out] ]	Actual data length
Return Value	EMV_TRUE:succeed EMV_FALSE:failed	

<b>Example</b>	
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### 2.1.50. FN\_CB\_USER\_REQUEST\_INTERFACE\_SEND

<b>Prototype</b>	<pre>typedef EMV_VOID (*FN_CB_USER_REQUEST_INTERFACE_SEND) (     EMV_PROGRAM callback_program,     EMV_KERNEL_ID kernel_id,     EMV_USER_INTERFACE_REQUEST_DATA_CPTR     user_interface_request_data) </pre>	
<b>Description</b>	Send the user request interface data	
<b>Parameters</b>	callback_program[in]	Handle of void *
	kernel_id[in]	Kernel ID
	user_interface_request_data[in]	User interface request data
<b>Return Value</b>	None	
<b>Example</b>		

### 2.1.51. FN\_CB\_DRL\_COUNT\_GET

<b>Prototype</b>	<pre>typedef EMV_UINT (*FN_CB_DRL_COUNT_GET) (     EMV_PROGRAM callback_program,     EMV_KERNEL_ID kernel_id,     EMV_UINT type) </pre>	
<b>Description</b>	Get the DRL parameter count	
<b>Parameters</b>	callback_program[in]	Handle of void *
	kernel_id[in]	Kernel ID
	type[in]	RFU
<b>Return Value</b>	Return the DRL count	
<b>Example</b>		

## 2.1.52. FN\_CB\_DRL\_GET

<b>Prototype</b>	<pre>typedef EMV_BOOL (*FN_CB_DRL_GET) (     EMV_PROGRAM callback_program,     EMV_KERNEL_ID kernel_id,     EMV_UINT type,     EMV_UINT rec_no,     EMV_BYTE_PTR param,     EMV_UINT_PTR param_len)</pre>	
<b>Description</b>		
<b>Parameters</b>	callback_program[in]	Handle of void *
	kernel_id[in]	Kernel ID
	type[in]	RFU
	rec_no[in]	DRL Record number
	param[out]	DRL parameter
	param_len[out]	Parameter length
<b>Return Value</b>	EMV_TRUE:succeed EMV_FALSE:failed	
<b>Example</b>		

## 2.2. Framework API

### 2.2.1. emv\_fw\_version\_get

<b>Prototype</b>	EMV_CHAR_CPTR emv_fw_version_get(EMV_VOID);	
<b>Description</b>	Get version number of the EMV Framework.	
<b>Parameters</b>	None	
<b>Return Value</b>	String of version of Framework.	
<b>Example</b>		

### 2.2.2. emv\_fw\_version\_time\_get

<b>Prototype</b>	EMV_CHAR_CPTR emv_fw_version_time_get(EMV_VOID);
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<b>Description</b>	Get the date and time of the Framework.	
<b>Parameters</b>	None	
<b>Return Value</b>	String of version of Framework.	
<b>Example</b>		

### 2.2.3. emv\_fw\_init

<b>Prototype</b>	EMV_FRAME_WORK emv_fw_init( EMV_CALLBACKS_PTR Callbacks);	
<b>Description</b>	Initialize EMV Framework and get instantiate of the module.	
<b>Parameters</b>	Callbacks[in] ]	Callback functions from the application program.
<b>Return Value</b>	NULL:Initialize failed Other:Initialize successful	
<b>Example</b>		

### 2.2.4. emv\_fw\_free

<b>Prototype</b>	EMV_VOID emv_fw_free(EMV_FRAME_WORK fw);	
<b>Description</b>	Free instance handle of the EMV Framework.	
<b>Parameters</b>	fw[in]	Handle of Framework module.
<b>Return Value</b>	None	
<b>Example</b>		

## 2.3. Framework database API

### 2.3.1. emv\_database\_value\_set

<b>Prototype</b>	EMV_ERROR emv_database_value_set( EMV_FRAME_WORK fw, EMV_DATA_SOURCE data_source, EMV_TAG templete, EMV_TAG tag,	
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	EMV_VOID_CPTR value, EMV_UINT value_len, EMV_BOOL OverWrite);	
<b>Description</b>	Set Tag to database	
<b>Parameters</b>	fw[in]	Handle of Framework module.
	data_source[in]	enum{ EMV_DATA_SOURCE_ICC =01, EMV_DATA_SOURCE_TERMINAL=02, EMV_DATA_SOURCE_ISSUER =04, EMV_DATA_SOURCE_ISSUER_TERMINAL=06, EMV_DATA_SOURCE_KERNEL=08, EMV_DATA_SOURCE_ALL=0F }EMV_DATA_SOURCE;
	templete[in]	Tag template
	tag[in]	tag
	value[in]	Value of tag
	value_len[in]	Length
	OverWrite[in]	Whether to allow over write
<b>Return Value</b>	EMV_OK: set success Other: set failed	
<b>Example</b>		

### 2.3.2. emv\_database\_value\_get

<b>Prototype</b>	EMV_ERROR emv_database_value_get( EMV_FRAME_WORK fw, EMV_TAG tag, EMV_VOID_PTR value, EMV_UINT_PTR value_len);	
<b>Description</b>	get Tag to database, must malloc memory for value	
<b>Parameters</b>	fw[in]	Handle of Framework module.
	tag[in]	tag of need to get
	value[out]	Value of the tag
	value_len[out]	Length
<b>Return Value</b>	EMV_OK: set success Other: set failed	
<b>Example</b>	EMV_BYTE value[2];	

	<pre> Len = sizeof(value); emv_database_value_get(paypass-&gt;m_fw, TAG_MC_CVC3_TRACK2, value, &amp;len); </pre>
--	--

### 2.3.3. emv\_database\_value\_get\_ex

<b>Prototype</b>	<pre> EMV_ERROR emv_database_value_get_ex( EMV_FRAME_WORK fw, EMV_TAG        tag, EMV_BYTE_CPTR  value, EMV_UINT_PTR   value_len); </pre>	
<b>Description</b>	get Tag to database, no need malloc memory for *value	
<b>Parameters</b>	fw[in]	Handle of Framework module.
	tag[in]	tag
	value[out]	Point the pointer that Point Tag memory
	value_len[out]	Point to actual Length
<b>Return Value</b>	EMV_OK: get success Other: get failed	
<b>Example</b>	<pre> EMV_BYTE_CPTR value=NULL; emv_database_value_get_ex(jcb-&gt;m_fw, TAG_TRACK_2_EQUIVALENT_DATA, &amp;value, &amp;len); </pre>	

## 2.4. Framework other API

### 2.4.1. emv\_outcome\_param\_init

<b>Prototype</b>	<pre> EMV_VOID emv_outcome_param_init( EMV_FRAME_WORK fw, EMV_OUTCOME_PARAM outcome); </pre>	
<b>Description</b>	get Tag to database, must malloc memory for value	
<b>Parameters</b>	fw[in]	Handle of Framework module.
	outcome[out]	Contactless transaction outcome pointer
<b>Return Value</b>	None	
<b>Example</b>		

## 2.4.2. emv\_user\_interface\_reqeust\_data\_init

<b>Prototype</b>	EMV_VOID emv_user_interface_reqeust_data_init( EMV_FRAME_WORK fw, EMV_USER_INTERFACE_REQUEST_DATA user_interface_request_data);	
<b>Description</b>	Initial user interface data	
<b>Parameters</b>	fw[in]	Handle of Framework module.
	user_interface_request_data[out]	User interface data object pointer
<b>Return Value</b>	None	
<b>Example</b>		

## 2.4.3. emv\_error\_indication\_init

<b>Prototype</b>	EMV_VOID emv_error_indication_init( EMV_FRAME_WORK fw, EMV_ERROR_INDICATION_PTR error_indication);	
<b>Description</b>	Initial the error indication.	
<b>Parameters</b>	fw[in]	Handle of Framework module.
	error_indication[out]	Error indication object pointer.
<b>Return Value</b>	None	
<b>Example</b>		

## 2.5. Data Structure definition

### 2.5.1. Payment data structure

```
typedef struct{
    EMV_KERNEL_ID                m_kernel_id;
```



```

EMV_OUTCOME_PARAM_T      m_outcome;
EMV_BOOL                  m_error_indication_present;
EMV_ERROR_INDICATION_T    m_error_indication;
EMV_USER_INTERFACE_REQUEST_DATA_T  m_user_interface_request_data;
EMV_USER_INTERFACE_REQUEST_DATA_T  m_user_interface_request_data_on_restart;
}EMV_PAYMENT_T, *EMV_PAYMENT_PTR;

```

## 2.5.2. Outcome Parameter data structure

```

typedef struct EMV_OUTCOME_PARAM_S{
    EMV_OUTCOME_STATUS      m_status;
    EMV_OUTCOME_START      m_start;
    EMV_OUTCOME_ONLINE_RESPONSE_DATA  m_online_response_data;
    EMV_OUTCOME_CVM        m_cvm;
    EMV_BOOL                m_ui_request_on_outcome_present;
    EMV_BOOL                m_ui_request_on_restart_present;
    EMV_BOOL                m_data_record_present;
    EMV_BOOL                m_discretionary_data_present;
    EMV_BOOL                m_receipt_requested;
    EMV_OUTCOME_ALTERNATE_INTERFACE_PREFERENCE  m_alternate_interface_preference;
    EMV_OUTCOME_FIELD_OFF_REQUEST  m_field_off_request;
    EMV_BYTE                m_removal_timeout;
}EMV_OUTCOME_PARAM_T;
typedef EMV_OUTCOME_PARAM_T * EMV_OUTCOME_PARAM_PTR;
typedef const EMV_OUTCOME_PARAM_T * EMV_OUTCOME_PARAM_CPTR;

```

## 2.5.3. Error Indication data structure

```

typedef struct{
    EMV_L1_ERROR_T    m_L1;
    EMV_L2_ERROR_T    m_L2;
    EMV_L3_ERROR_T    m_L3;
    EMV_SW            m_sw12;
    EMV_MESSAGE_IDENTIFIER  m_msg_on_error;
}EMV_ERROR_INDICATION_T;
typedef EMV_ERROR_INDICATION_T * EMV_ERROR_INDICATION_PTR;
typedef const EMV_ERROR_INDICATION_T * EMV_ERROR_INDICATION_CPTR;

```

## 2.6. Error number definition

Error Symbol	Error Number	description
EMV_OK	0	Successful OK or APPROVED
EMV_COLLISION	1	Multiple card detected
EMV_CANCELED	100	Transaction stop.
EMV_NO_CARD	101	No card.
EMV_OK_DELAYED_AUTHORIZATION	102	Required Delayed authorization
EMV_NO_APP_SUPPORTED	103	Terminal don't have application supported by the card
EMV_APP_LOCKED	104	Application Locked
EMV_FORCE_APPROVED=5	105	Transaction force approved
EMV_DECLIEND	106	Transaction was declined
EMV_REQUIRE_ONLINE	107	Transaction required online
EMV_REQUIRE_ONLINE_LONG_TAP	108	Transaction required online with card keep in the contactless field
EMV_REQUIRE_ONLINE_2END_TAP	109	Transaction required online with second card tap
EMV_REQUIRE_ONLINE_2END_TAP_IF_HAS_SCRIPT	110	Transaction required online, second card tap required if there has script from the host
EMV_REQUIRE_ONLINE_2END_TAP_IF_HAS_SCRIPT_OR_IAD	111	
EMV_SELECT_NEXT	112	Select Next Application
EMV_TRY_AGAIN	113	Reader return error, try again
EMV_PRESENT_CARD_AGAIN	114	Start the transaction again and present card
EMV_OTHER_CARD	115	Current card not supported, Use other card
EMV_OTHER_INTERFACE	116	Try to insert card or swipe card
EMV_TRY_AGAIN_SEEPHONE	117	Try again when GPO return 6986
EMV_ODA_ONLINE_DDA_APPROVED	118	Online ODA FDDA approve
EMV_ODA_ONLINE_DDA_DECLINED	119	Online ODA FDDA failed, declined
EMV_ODA_ONLINE_SDA_APPROVED	120	Online ODA SDA approve
EMV_ODA_ONLINE_SDA_DECLINED	121	Online ODA SDA failed, declined
EMV_ODA_ONLINE_DDA_FAILED_ONLINE	122	Online ODA FDDA failed, go online
EMV_ODA_ONLINE_SDA_FAILED_ONLINE	123	Online ODA SDA failed, go online
EMV_ODA_ONLINE_FAILED_D	124	online ODA failed, QUICS required

ECLINED		
EMV_SERVICE_NOT_ALLOWED	125	Transaction type not allowed
EMV_SERVICE_NOT_ACCEPTED	126	Transaction type not accepted
EMV_TERMINATED	127	Transaction terminated
EMV_INTERRUPT_BY_INSERTED	128	Transaction was canceled because of card insert
EMV_INTERRUPT_BY_SWIPED	129	Transaction was canceled because of card swiped
EMV_ISSUER_UPDATE_FAILED	130	Issuer script execute failed
EMV_TRANSACTION_LIMIT_EXCEED	131	Transaction Limit Exceed
EMV_CARD_FILE_NOT_FOUND	200	Card application file not found
EMV_CARD_BLOCKED	201	Card was locked
EMV_CARD_CMD_WARNING	202	Card APDU command success with warning
EMV_CARD_CMD_FAILED	203	Card command failed
EMV_CARD_PIN_WRONG	204	PIN not correct
EMV_CARD_PIN_BLOCKED	205	PIN locked
EMV_CARD_INVALID_DATA	206	Data from the card are invalid
EMV_CARD_DATA_MISSING	207	Data missing from the card
EMV_CARD_DATA_DUPLICATE	208	Data duplicated from the card
EMV_CARD_IN_EXCEPTION_FILE	209	Card in the exception file
EMV_CARD_LAST_RECORD_CMD_FAILED	210	Card command failed for read the last record
EMV_ODA_CAPK_NOT_FOUND	300	CA public key not found
EMV_ODA_IPK_REVOKED	301	Issuer public key certificate was revoked
EMV_ODA_SDA_FAILED	302	Offline data authentication - SDA failed
EMV_ODA_DDA_FAILED	303	Offline data authentication - DDA failed
EMV_ODA_CDA_FAILED	304	Offline data authentication - CDA failed
EMV_ODA_FDDA_FAILED	305	Offline data authentication - FDDA failed
EMV_ODA_KEY_RECOVER_FAILED	306	Offline data authentication - Key recover failed
EMV_APPLICATION_EXPIRED	307	Application Expired
EMV_GAC_REQUEST_ADVICE	308	Card required Advice(For Contact only)
EMV_TAG_DUPLICATE	309	Data duplicated into the database
EMV_TAG_UNDEFIND	310	Unknown Tag
EMV_TAG_IS_CONSTRUCTED	311	Tag is a template
EMV_DATA_LENGTH_INVALID	312	Data length invalid
EMV_DATA_NOT_PRESENT	313	Data not present
EMV_DATA_EMPTY	314	Data length is zero

EMV_DATA_INVALID	315	Data length or format invalid
EMV_DATA_PARSE_ERROR	316	Data format invalid, parsing failed
EMV_DATA_TEMPLATE_NO_MATCHED	317	Data under wrong template
EMV_TLV_INVALID	318	TLV data invalid
EMV_ICCARD_ERROR	400	Contact or Contactless reader return error
EMV_ICCARD_APDU_IN_PROCESS	401	APDU in processing
EMV_HSM_ERROR	500	Encrypt or decrypt failed
EMV_NO_SUPPORTED	501	Function no supported
EMV_NO_IMPLEMENTED	502	Function no implemented
EMV_NO_MORE_DATA	503	Reached the end of the data
EMV_MEMORY_OVERFLOW	504	Malloc memory failed
EMV_MEMORY_NO_ENOUGH	505	Buffer size too small
EMV_TIMEOUT	506	Timeout
EMV_CALLBACK_ERROR	507	Callback failed
EMV_PARAM_ERROR	508	Parameter invalid
EMV_OTHER_ERROR	509	Other error
EMV_QUICS_ERROR_MUTE_RETRY	600	QUICS, mute transaction
EMV_QUICS_ERROR_MUTE_RECOVERED	601	QUICS, mute transaction recovered
EMV_QUICS_ERROR_CARD_NOT_SAME	602	QUICS, card presented not same as the last one
EMV_QUICS_ERROR_EXPIRED_ONLINE	603	Card or application expired, go online

## 2.7. Data Type definition

### 2.7.1. Base data type

typedef	unsigned long long	EMV_SIZE_T;
typedef	unsigned int	EMV_UINT;
typedef	unsigned char	EMV_BYTE;
typedef	int	EMV_INT;
typedef	char	EMV_CHAR;
typedef	void	EMV_VOID;
typedef	unsigned short	EMV_SHORT;
typedef	unsigned long long	EMV_AMOUNT;
typedef	unsigned long long	EMV_TICKCOUNT;
typedef	unsigned long long	EMV_ULONG;

---

```
typedef      long long      EMV_LONG;

typedef      enum{
    EMV_FALSE = 0,
    EMV_TRUE
}EMV_BOOL;

typedef      EMV_BYTE *      EMV_BYTE_PTR;
typedef      const EMV_BYTE * EMV_BYTE_CPTR;
typedef      const EMV_BYTE ** EMV_BYTE_CPPTR;
typedef      EMV_CHAR *      EMV_CHAR_PTR;
typedef      const EMV_CHAR * EMV_CHAR_CPTR;
typedef      const EMV_CHAR ** EMV_CHAR_CPPTR;
typedef      EMV_VOID *      EMV_VOID_PTR;
typedef      const EMV_VOID * EMV_VOID_CPTR;
typedef      const EMV_VOID ** EMV_VOID_CPPTR;
typedef      EMV_VOID *      EMV_HANDLE;
typedef      EMV_BOOL *      EMV_BOOL_PTR;

typedef      struct EMV_PROGRAM_S *      EMV_PROGRAM;
typedef      struct EMV_ENTRY_POINT_S *   EMV_ENTRY_POINT;
typedef      struct EMV_KERNEL_S *        EMV_KERNEL;
typedef      struct EMV_FRAME_WORK_S *    EMV_FRAME_WORK;
typedef      struct EMV_OUTCOME_PARAM_S * EMV_OUTCOME_PARAM;
```

## 2.7.2. enum data type definition

### 2.7.2.1. EMV data format

```
typedef enum{
    EMV_FORMAT_A    = 00,
    EMV_FORMAT_AN   = 01,
    EMV_FORMAT_ANS  = 02,
    EMV_FORMAT_B    = 03,
    EMV_FORMAT_CN   = 04,
    EMV_FORMAT_N    = 05
}EMV_DATA_FORMAT;
```

### 2.7.2.2. EMV Data Source

```
typedef enum{
```

---

```
EMV_DATA_SOURCE_ICC          =01,
EMV_DATA_SOURCE_TERMINAL     =02,
EMV_DATA_SOURCE_ISSUER       =04,
EMV_DATA_SOURCE_ISSUER_TERMINAL =06,
EMV_DATA_SOURCE_KERNEL       =08,
EMV_DATA_SOURCE_ALL          =0F
}EMV_DATA_SOURCE;
```

### 2.7.2.3. EMV Kernel Type

```
typedef enum{
    EMV_KERNEL_TYPE_UNKNOW,
    EMV_CONTACT,
    EMV_CONTACTLESS
}EMV_KERNEL_TYPE;
typedef EMV_KERNEL_TYPE * EMV_KERNEL_TYPE_PTR;
```

### 2.7.2.4. EMV Kernel ID

```
typedef enum{
    KERNEL_EMV      = 00,
    KERNEL_PAYPASS   = 02,
    KERNEL_PAYWAVE   = 03,
    KERNEL_AMEX      = 04,
    KERNEL_JCB       = 05,
    KERNEL_DISCOVER  = 06,
    KERNEL_QPBOC     = 07,
    KERNEL_RUPAY     = 0D,
    KERNEL_ZIP       = FB,
    KERNEL_PURE      = FC,
    KERNEL_INTERAC   = FD,
    KERNEL_NSICC     = FE,
    KERNEL_UNKNOW    = FF
}EMV_KERNEL_ID;
typedef EMV_KERNEL_ID * EMV_KERNEL_ID_PTR;
typedef const EMV_KERNEL_ID * EMV_KERNEL_ID_CPTR;
```

### 2.7.2.5. EMV Application Type

```
typedef enum
{
    EMV_APP_MSD,
```

---

```
    EMV_APP_EMV,  
    EMV_APP_STANDARD  
}EMV_APP_TYPE;
```

#### 2.7.2.6. Outcome Status

```
typedef enum{  
    EMV_OUTCOME_STATUS_APPROVED =          10,  
    EMV_OUTCOME_STATUS_DECLIEND =          20,  
    EMV_OUTCOME_STATUS_ONLINE_REQUEST =    30,  
    EMV_OUTCOME_STATUS_END_APPLICATION =    40,  
    EMV_OUTCOME_STATUS_SELECT_NEXT =       50,  
    EMV_OUTCOME_STATUS_TRY_ANOTHER_INTERFACE = 60,  
    EMV_OUTCOME_STATUS_TRY_AGAIN =         70,  
    EMV_OUTCOME_STATUS_NA =                F0  
}EMV_OUTCOME_STATUS;
```

#### 2.7.2.7. Outcome CVM

```
typedef enum{  
    EMV_OUTCOME_CVM_NO_CVM =                00,  
    EMV_OUTCOME_CVM_OBTAIN_SIGNATURE =      10,  
    EMV_OUTCOME_CVM_ONLINE_PIN =            20,  
    EMV_OUTCOME_CVM_CONFIRMATION_CODE_VERIFIED = 30,  
    EMV_OUTCOME_CVM_NA =                    F0  
}EMV_OUTCOME_CVM;
```

#### 2.7.2.8. L1 Error number

```
typedef enum{  
    EMV_L1_OK = 00,  
    EMV_L1_TIME_OUT_ERROR = 01,  
    EMV_L1_TRANSMISSION_ERROR = 10,  
    EMV_L1_TIME_PRTOCOL_ERROR = 11,  
}EMV_L1_ERROR_T;
```

#### 2.7.2.9. L2 Error number

```
typedef enum{
```

---

```
EMV_L2_OK = 00,  
EMV_L2_CARD_DATA_MISSING = 01,  
EMV_L2_CAM_FAILED = 02,  
EMV_L2_STATUS_BYTES = 03,  
EMV_L2_PARSING_ERROR = 04,  
EMV_L2_MAX_LIMIT_EXCEEDED = 05,  
EMV_L2_CARD_DATA_ERROR = 06,  
EMV_L2_MAGSTRIPE_NOT_SUPPORTED = 07,  
EMV_L2_NO_PPSE = 08,  
EMV_L2_PPSE_FAULT = 09,  
EMV_L2_EMPTY_CANDIDATE_LIST = 0A,  
EMV_L2_IDS_READ_ERROR = 0B,  
EMV_L2_IDS_WRITE_ERROR = 0C,  
EMV_L2_IDS_DATA_ERROR = 0D,  
EMV_L2_IDS_NO_MATCHING_AC = 0E,  
EMV_L2_TERMINAL_DATA_ERROR = 0F,  
}EMV_L2_ERROR_T;  
typedef EMV_L2_ERROR_T * EMV_L2_ERROR_PTR;  
typedef const EMV_L2_ERROR_T * EMV_L2_ERROR_CPTR;
```

#### 2.7.2.10. L3 Error number

```
typedef enum{  
    EMV_L3_OK = 00,  
    EMV_L3_TIME_OUT = 01,  
    EMV_L3_STOP = 10,  
    EMV_L3_AMOUNT_NOT_PRESENT = 11,  
}EMV_L3_ERROR_T;
```

#### 2.7.2.11. Online result

```
typedef enum{  
    EMV_ONLINE_APPROVED,  
    EMV_ONLINE_DECLIEND,  
    EMV_ONLINE_ERROR,  
    EMV_ONLINE_NA = ff,  
}EMV_ONLINE_RESULT;  
typedef EMV_ONLINE_RESULT * EMV_ONLINE_RESULT_PTR;
```



## 2.8. Micro definition

### 2.8.1. Transaction Type

symbol	value
EMV_TRANS_PURCHASE	00
EMV_TRANS_CASH	01
EMV_TRANS_PURCHASE_WITH_CASH_BACK	09
EMV_TRANS_MANUAL_CASH	12
EMV_TRANS_QUASI_CASH	11
EMV_TRANS_CASH_DISBURSEMENT	17
EMV_TRANS_REFUND	20
EMV_TRANS_CASE_DEPOSIT	21
EMV_TRANS_INQUIRE	31
EMV_TRANS_TRANSFER	60
EMV_TRANS_PAYMENT	50
EMV_TRANS_ADMIN	66
EMV_TRANS_RETRIEVE	78
EMV_TRANS_UPDATE	79
EMV_TRANS_AUTH_APPLICATION	90
EMV_TRANS_MONEY_ADD_LEGACY_RUPAY	33
EMV_TRANS_VOID_RUPAY	34
EMV_TRANS_MONEY_ADD_NO_LEGACY_RUPAY	28
EMV_TRANS_BALANCE_ENQUIRY_NO_LEGACY_RUPAY	31
EMV_TRANS_SERVICE_CREATION_NO_LEGACY_RUPAY	83
PAYPASS_UNKOWN_TYPE	88

### 2.8.2. Kernel API Interface name

symbol	value
API_KERNEL_TYPE_GET	"emv_kernel_type_get"
API_KERNEL_NAME_GET	"emv_kernel_name_get"
API_KERENL_VERSION_GET	"emv_kernel_version_get"
API_KERNEL_ID_GET	"emv_kernel_id_get"
API_KERNEL_INIT	"emv_kernel_init"
API_KERNEL_FREE	"emv_kernel_free"
API_KERNEL_ACTIVE	"emv_kernel_active"

API_KERNEL_CONFIG_CHECKSUM_GET	"emv_kernel_config_checksum_get"
API_CONTACTLESS_FALLBACK_AID_SUPPORTED	"emv_cl_fallback_aid_supported"
API_CONTACTLESS_PRE_TRANSACTION	"emv_cl_pre_transaction"
API_CONTACTLESS_TRANSACTION	"emv_cl_transaction"
API_CONTACTLESS_TRANSACTION_COMPLETION	"emv_cl_transaction_completion"
API_CONTACTLESS_TORN_CLEAN	"emv_cl_torn_clean"
API_CONTACTLESS_TORN_ADD	"emv_cl_torn_add"
API_CONTACT_INITIATE_APPLICATION	"emv_ct_initiate_application"
API_CONTACT_READ_APPLICATION_DATA	"emv_ct_read_application_data"
API_CONTACT_DATA_AUTHENTICATION	"emv_ct_data_authentication"
API_CONTACT_PROCESS_RESTRICTION	"emv_ct_process_restriction"
API_CONTACT_CARDHOLDER_VERIFICATION	"emv_ct_cardholder_verification"
API_CONTACT_TERMINAL_RISK_MANAGEMENT	"emv_ct_terminal_risk_management"
API_CONTACT_TERMINAL_ACTION_ANALYZE	"emv_ct_terminal_action_analysis"
API_CONTACT_CARD_ACTION_ANALYSIS	"emv_ct_card_action_analysis"
API_CONTACT_COMPLETION	"emv_ct_completion"
API_CONTACT_READ_LOG	"emv_ct_read_log"

## 3. Entry Point

### 3.1. Common API

#### 3.1.1. ep\_version\_get

<b>Prototype</b>	EMV_CHAR_CPTR ep_version_get(EMV_VOID);	
<b>Description</b>	Get the version of EP Module.	
<b>Parameters</b>	None	
<b>Return Value</b>	Return Version String	
<b>Example</b>		

### 3.1.2. ep\_version\_time\_get

<b>Prototype</b>	<code>EMV_CHAR_CPTR ep_version_time_get(EMV_VOID);</code>	
<b>Description</b>	Get compile time of the module	
<b>Parameters</b>	None	
<b>Return Value</b>	Return the compile time.	
<b>Example</b>		

### 3.1.3. emv\_ep\_init

<b>Prototype</b>	<code>EMV_ENTRY_POINT emv_ep_init(EMV_FRAME_WORK fw);</code>	
<b>Description</b>	Initialize the handle of EP module.	
<b>Parameters</b>	fw[in]	Handle of Framework module.
<b>Return Value</b>	Return pointer that point to EMV_ENTRY_POINT_T structure address	
<b>Example</b>		

### 3.1.4. emv\_ep\_free

<b>Prototype</b>	<code>EMV_VOID emv_ep_free(EMV_ENTRY_POINT ep);</code>	
<b>Description</b>	Free instance handle of the EP module.	
<b>Parameters</b>	ep[in]	Handle of the EP Module.
<b>Return Value</b>		
<b>Example</b>		

### 3.1.5. emv\_ep\_kernel\_count\_get

<b>Prototype</b>	<code>EMV_UINT</code>	<code>emv_ep_kernel_count_get(EMV_ENTRY_POINT</code>
------------------	-----------------------	--

	ep);	
<b>Descripti on</b>	Get the kernel count number.	
<b>Parameter s</b>	ep[in]	Handle of the EP Module.
<b>Return Value</b>		
<b>Example</b>		

### 3.1.6. emv\_ep\_kernel\_id\_get

<b>Prototype</b>	EMV_KERNEL_ID emv_ep_kernel_id_get( EMV_ENTRY_POINT ep, EMV_UINT data_index);	
<b>Descripti on</b>	Get kernel Id.	
<b>Parameter s</b>	ep[in]	Handle of the EP module.
	Data_index[i n]	Index of the kernel.
<b>Return Value</b>		
<b>Example</b>		

### 3.1.7. emv\_ep\_kernel\_type\_get

<b>Prototype</b>	EMV_KERNEL_TYPE emv_ep_kernel_type_get( EMV_ENTRY_POINT ep, EMV_KERNEL_ID kernel_id);	
<b>Descripti on</b>	Get kernel Id.	
<b>Parameter s</b>	ep[in]	Handle of the EP module.
	kernel_id[ou t]	Kernel ID.
<b>Return Value</b>	EMV_KERNEL_TYPE_UNKNOW: do not know the kernel EMV_CONTACT: contact kernel EMV_CONTACTLESS: Contactless kernel	
<b>Example</b>		

### 3.1.8. emv\_ep\_kernel\_name\_get

<b>Prototype</b>	EMV_CHAR_CPTR emv_ep_kernel_name_get( EMV_ENTRY_POINT ep, EMV_KERNEL_ID kernel_id);	
<b>Description</b>	Get kernel name	
<b>Parameters</b>	ep[in]	Handle of the EP module.
	kernel_id[in] ]	Kernel ID.
<b>Return Value</b>	Return the string kernel name according to the kernel id	
<b>Example</b>		

### 3.1.9. emv\_ep\_kernel\_version\_get

<b>Prototype</b>	EMV_CHAR_CPTR emv_ep_kernel_version_get( EMV_ENTRY_POINT ep, EMV_KERNEL_ID kernel_id);	
<b>Description</b>	Get kernel version number	
<b>Parameters</b>	ep[in]	Handle of the EP module.
	kernel_id[in] ]	Kernel ID.
<b>Return Value</b>	Return the string version number according to the kernel id indicate	
<b>Example</b>		

### 3.1.10. emv\_ep\_kernel\_version\_get

<b>Prototype</b>	EMV_CHAR_CPTR emv_ep_kernel_checksum_get( EMV_ENTRY_POINT ep, EMV_KERNEL_ID kernel_id);	
<b>Description</b>	Get kernel checksum	
<b>Parameters</b>	ep[in]	Handle of the EP module.
	kernel_id[in] ]	Kernel ID.
<b>Return</b>	Return the checksum of kernel library that the kernel	

<b>Value</b>	id indicated
<b>Example</b>	

### 3.1.11. emv\_ep\_kernel\_load

<b>Prototype</b>	<pre> EMV_ERROR emv_ep_kernel_load(     EMV_ENTRY_POINT ep,     EMV_CHAR_CPTR kernel_checksum,     FN_KERNEL_TYPE_GET func_kernel_type_get,     FN_KERNEL_NAME_GET func_kernel_name_get,     FN_KERNEL_VERSION_GET func_kernel_version_get,     FN_KERNEL_ID_GET func_kernel_id_get,     FN_KERNEL_FALLBACK_AID_SUPPORTED     func_contactless_fallback_aid_supported,     FN_KERNEL_INIT func_kernel_init,     FN_KERNEL_FREE func_kernel_free,     FN_KERNEL_CONFIG_CHECKSUM_GET     func_kernel_config_checksum_get,     FN_KERNEL_ACTIVE func_kernel_active,     FN_CONTACTLESS_PRE_TRANSACTION     func_contactless_pre_transaction,     FN_CONTACTLESS_TRANSACTION     func_contactless_transaction,     FN_CONTACTLESS_TRANSACTION_COMPLETION     func_contactless_transaction_completion,     FN_CONTACTLESS_TORN_CLEAN func_contactless_torn_clean,     FN_CONTACTLESS_TORN_ADD     func_contactless_torn_add,     FN_CONTACT_INITIATE_APPLICATION     func_contact_initiate_application,     FN_CONTACT_READ_APPLICATION_DATA     func_contact_read_application_data,     FN_CONTACT_DATA_AUTHENTICATION     func_contact_data_authentication,     FN_CONTACT_PROCESS_RESTRICTION     func_contact_process_restriction,     FN_CONTACT_CARDHOLDER_VERIFICATION     func_contact_cardholder_verification,     FN_CONTACT_TERMINAL_RISK_MANAGEMENT     func_contact_terminal_risk_management,     FN_CONTACT_TERMINAL_ACTION_ANALYZE     func_contact_terminal_action_analysis, </pre>
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	<pre> FN_CONTACT_CARD_ACTION_ANALYSIS     func_contact_card_action_analysis, FN_CONTACT_COMPLETION     func_contact_completion, FN_CONTACT_READ_LOG     func_contact_read_log ); </pre>	
<b>Description</b>	Load the kernel library to the entrypoint	
<b>Parameters</b>	ep[in]	Handle of the EP module.
	kernel_checksum[in]	Kernel library check sum
	func_kernel_type_get[in]	Set the callback function to kernel list
	func_kernel_name_get[in]	
	func_kernel_version_get[in]	
	func_kernel_id_get[in]	
	func_contactless_fall_back_aid_supported[in]	
	func_kernel_init[in]	
	func_kernel_free[in]	
	func_kernel_config_checksum_get[in]	
	func_kernel_active[in]	
	func_contactless_pre_transaction[in]	
	func_contactless_transaction[in]	
	func_contactless_transaction_completion[in]	
	func_contactless_torn_clean[in]	
	func_contactless_torn_add[in]	
	func_contact_initiate_application[in]	
	func_contact_read_application_data[in]	
	func_contact_data_aut	

	hentication[in]	
	func_contact_process_restriction[in]	
	func_contact_cardholder_verification[in]	
	func_contact_terminal_risk_management[in]	
	func_contact_terminal_action_analysis[in]	
	func_contact_card_action_analysis[in]	
	func_contact_completion[in]	
	func_contact_read_log[in]	
<b>Return Value</b>	EMV_OK: Success Other: Failed	
<b>Example</b>		

### 3.1.12. emv\_ep\_kernel\_param\_set

Prototype	EMV_ERROR emv_ep_kernel_param_set( EMV_ENTRY_POINT ep, EMV_KERNEL_ID   kernel_id, EMV_BYTE_CPTR    param, EMV_UINT           param_len);	
Description	Set kernel parameter	
Parameters	ep[in]	Handle of the EP module.
	kernel_id[in] ]	Id of the kernel.
	param[int]	Kernel parameter must to be TVR Format
	param_len[in] ]	Length of the parameter
Return Value	EMV_OK: Success Other: Failed	
Example		



### 3.1.13. emv\_ep\_kernel\_param\_get

<b>Prototype</b>	<pre>EMV_ERROR emv_ep_kernel_param_get(     EMV_ENTRY_POINT ep,     EMV_KERNEL_ID   kernel_id,     EMV_BYTE_PTR    param,     EMV_UINT_PTR    param_len,     EMV_CHAR_PTR    checksum,     EMV_UINT        checksum_len);</pre>	
<b>Description</b>	Set kernel param	
<b>Parameters</b>	ep[in]	Handle of the framework module.
	kernel_id[in]	Kernel ID.
	Param[out]	Kernel configuration parameter.
	param_len[out]	Length of the parameter data
	checksum	Kernel configuration checksum
	checksum_len	Size of the checksum buffer
<b>Return Value</b>	EMV_OK: Success Other: Failed	
<b>Example</b>		

### 3.1.14. emv\_ep\_kernel\_param\_clean

<b>Prototype</b>	<pre>EMV_ERROR emv_ep_kernel_param_clean(EMV_ENTRY_POINT ep)</pre>	
<b>Description</b>	Clear kernel parameter	
<b>Parameters</b>	ep[in]	Handle of the EP module.
<b>Return Value</b>	EMV_OK: Success Other: Failed	
<b>Example</b>		

### 3.1.15. emv\_ep\_pre\_transaction

<b>Prototype</b>	<pre>EMV_ERROR emv_ep_pre_transaction(     EMV_ENTRY_POINT ep,     EMV_BOOL        read_log,</pre>	
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	EMV_BYTE_CPTR trans_data, EMV_UINT trans_data_len);	
<b>Description</b>	Set kernel param	
<b>Parameters</b>	ep[in]	Handle of the EP module.
	read_log[in]	EMV_TRUE: prepare a transaction to read log from the card EMV_FALSE: normal process before transaction
	trans_data[in]	Transaction data, TLV format
	trans_data_len[in]	Length of the transaction data
<b>Return Value</b>	EMV_OK: Success Other: Failed	
<b>Example</b>		

### 3.1.16. emv\_ep\_current\_kernel\_id\_get

<b>Prototype</b>	EMV_ERROR emv_ep_current_kernel_id_get(EMV_ENTRY_POINT ep, EMV_KERNEL_ID_PTR KernelId)	
<b>Description</b>	Clear kernel parameter	
<b>Parameters</b>	ep[in]	Handle of the EP module.
	kernelId[out]	Kernel ID for current transaction
<b>Return Value</b>	EMV_OK: Success Other: Failed	
<b>Example</b>		

## 3.2. Contact API

### 3.2.1. emv\_ep\_contact\_build\_candidate\_list

<b>Prototype</b>	EMV_ERROR emv_ep_contact_build_candidate_list( EMV_ENTRY_POINT ep, EMV_BOOL no-contact, EMV_BOOL ignore_blocked);	
<b>Description</b>	Build candidate list	

<b>Parameters</b>	ep[in]	Handle of the EP module.
	no-contact[in]	EMV_TRUE: no-contact EMV_FALSE: contact
	ignore_blocked[in]	EMV_TRUE:include the blocked EMV_FALSE:Don't include the blocked applications
<b>Return Value</b>	EMV_OK: Success Other: Failed	
<b>Example</b>		

### 3.2.2. emv\_ep\_contact\_application\_select

<b>Prototype</b>	EMV_ERROR emv_ep_contact_application_select( EMV_ENTRY_POINT ep)	
<b>Description</b>	Select application	
<b>Parameters</b>	ep[in]	Handle of the EP module.
	EMV_OK: Success Other: Failed	
<b>Return Value</b>		
<b>Example</b>		

### 3.2.3. emv\_ep\_contact\_initiate\_application

<b>Prototype</b>	EMV_ERROR emv_ep_contact_initiate_application( EMV_ENTRY_POINT ep);	
<b>Description</b>	Initialize application	
<b>Parameters</b>	ep[in]	Handle of the EP module.
	EMV_OK: Success Other: Failed	
<b>Return Value</b>		
<b>Example</b>		

### 3.2.4. emv\_ep\_contact\_read\_application\_data

<b>Prototype</b>	EMV_ERROR emv_ep_contact_read_application_data( EMV_ENTRY_POINT ep);	
------------------	---	--

<b>Description</b>	Read application data	
<b>Parameters</b>	ep[in]	Handle of the EP module.
<b>Return Value</b>	EMV_OK: Success Other: Failed	
<b>Example</b>		

### 3.2.5. emv\_ep\_contact\_data\_authentication

<b>Prototype</b>	EMV_ERROR emv_ep_contact_data_authentication( EMV_ENTRY_POINT ep);	
<b>Description</b>	Offline data authentication	
<b>Parameters</b>	ep[in]	Handle of the EP module.
<b>Return Value</b>	EMV_OK: Success Other: Failed	
<b>Example</b>		

### 3.2.6. emv\_ep\_contact\_processing\_restrictions

<b>Prototype</b>	EMV_ERROR emv_ep_contact_processing_restrictions( EMV_ENTRY_POINT ep);	
<b>Description</b>	Check application version, AUC, expired time and effective time.	
<b>Parameters</b>	ep[in]	Handle of the EP module.
<b>Return Value</b>	EMV_OK: Success Other: Failed	
<b>Example</b>		

### 3.2.7. emv\_ep\_contact\_cardholder\_verification

<b>Prototype</b>	EMV_ERROR emv_ep_contact_cardholder_verification(EMV_ENTRY_POINT ep)	
<b>Description</b>	Cardholder verification	

<b>Parameters</b>	ep[in]	Handle of the EP module.
<b>Return Value</b>	EMV_OK: Success Other: Failed	
<b>Example</b>		

### 3.2.8. emv\_ep\_contact\_terminal\_risk\_management

<b>Prototype</b>	EMV_ERROR emv_ep_contact_terminal_risk_management( EMV_ENTRY_POINT ep);	
<b>Description</b>	Terminal risk management	
<b>Parameters</b>	ep[in]	Handle of the EP module.
<b>Return Value</b>	EMV_OK: Success Other: Failed	
<b>Example</b>		

### 3.2.9. emv\_ep\_contact\_terminal\_action\_analysis

<b>Prototype</b>	EMV_ERROR emv_ep_contact_terminal_action_analysis( EMV_ENTRY_POINT ep);	
<b>Description</b>	Terminal action analysis	
<b>Parameters</b>	ep[in]	Handle of the EP module.
<b>Return Value</b>	EMV_OK: Success Other: Failed	
<b>Example</b>		

### 3.2.10. emv\_ep\_contact\_card\_action\_analysis

<b>Prototype</b>	EMV_ERROR emv_ep_contact_card_action_analysis(EMV_ENTRY_POINT ep, EMV_BOOL_PTR advice_needed)	
<b>Description</b>	Terminal action analysis, send 1th GAC command	

<b>on</b>		
<b>Parameters</b>	ep[in]	Handle of the EP module.
	advice_needed[out]	EMV_TRUE: need send advice EMV_FALSE need not send advice
<b>Return Value</b>	EMV_OK: Success Other: Failed	
<b>Example</b>		

### 3.2.11. emv\_ep\_contact\_completion

<b>Prototype</b>	<pre>EMV_ERROR emv_ep_contact_completion(     EMV_ENTRY_POINT ep,     EMV_ONLINE_RESULT online_result,     EMV_BYTE_CPTR auth_resp_code,     EMV_UINT auth_resp_code_len,     EMV_BYTE_CPTR issuer_auth_data,     EMV_UINT issuer_auth_data_len,     EMV_BYTE_CPTR auth_code,     EMV_UINT auth_code_len,     EMV_BYTE_CPTR script,     EMV_UINT script_len,     EMV_BOOL_PTR advice_needed);</pre>	
<b>Description</b>	Send 2th GAC command after online, If transaction outcome is online process, the function must be called	
<b>Parameters</b>	ep[in]	Handle of the EP module.
	online_result[in]	Reference EMV_ONLINE_RESULT
	auth_resp_code[in]	Authorization response code
	auth_resp_code_len[in]	Length of the authorization response code
	issuer_auth_data[in]	Issuer authentication data
	issuer_auth_data_len[in]	Length of the issuer authentication data
	auth_code[in]	Authentication code
	auth_code_len[in]	Length of authentication code
	script[in]	Issuer script
	script_len[in]	Length of the issuer script
	advice_needed[out]	EMV_TRUE: need send advice EMV_FALSE: need not send advice

<b>Return Value</b>	EMV_OK: Success Other: Failed
<b>Example</b>	

### 3.2.12. emv\_ep\_contact\_read\_log\_info

<b>Prototype</b>	<pre>EMV_ERROR emv_ep_contact_read_log_info(     EMV_ENTRY_POINT ep,     EMV_TAG          tag_of_log_entry,     EMV_TAG          tag_of_log_format,     EMV_BYTE_PTR     sfi,     EMV_BYTE_PTR     max_num_of_record,     EMV_BYTE_PTR     log_format,     EMV_UINT_PTR     log_format_len );</pre>	
<b>Description</b>	Read card transaction log	
<b>Parameters</b>	ep[in]	Handle of the EP module.
	tag_of_log_entry[in]	Tag(9F4D)
	tag_of_log_format[in]	Tag(9F4F)
	sfi[out]	Short File Identifier
	max_num_of_record[out]	max number of the log
	log_format[out]	the format of the log
	log_format_len[out]	the length of the log format
<b>Return Value</b>	EMV_OK: Success Other: Failed	
<b>Example</b>		

### 3.2.13. emv\_ep\_contact\_read\_record\_log

<b>Prototype</b>	<pre>EMV_ERROR emv_ep_contact_read_record_log(     EMV_ENTRY_POINT ep,     EMV_BYTE       sfi,     EMV_BYTE       rec_no,     EMV_BYTE_CPTR  log_format,</pre>
------------------	--

	EMV_UINT            log_format_len, EMV_BYTE_PTR        record, EMV_UINT_PTR        record_len);	
<b>Description</b>	Read record log	
<b>Parameters</b>	ep[in]	Handle of the EP module.
	sfi[in]	Short File Identifier
	rec_no[in]	Record number for log
	log_format[in]	Format of card log
	log_format_len[in]	Length of log format
	Record[out]	Buffer to receive the record log data
	record_len[out]	Record log data length
<b>Return Value</b>	EMV_OK: Success Other: Failed	
<b>Example</b>		

### 3.2.14. emv\_ep\_contact\_read\_log

<b>Prototype</b>	EMV_ERROR emv_ep_contact_read_log( EMV_ENTRY_POINT ep, EMV_LOG_ID        log_id, EMV_LOG_DATA_PTR log);	
<b>Description</b>	Special log read	
<b>Parameters</b>	ep[in]	Handle of the EP module.
	log_id[in]	Defined by the kernel
	log[out]	Defined by the kernel
<b>Return Value</b>	EMV_OK: Success Other: Failed	
<b>Example</b>		

### 3.2.15. emv\_ep\_contact\_read\_amount

<b>Prototype</b>	EMV_ERROR emv_ep_contact_read_amount( EMV_ENTRY_POINT ep, EMV_TAG            tag, EMV_BOOL           bcd, EMV_UINT           value_len, EMV_AMOUNT_PTR    amount);	
<b>Description</b>	Read number from the card	



<b>Parameters</b>	ep[in]	Handle of the EP module.
	tag[in]	Tag(9F79)
	bcd[in]	EMV_TRUE: BCD format EMV_FALSE: Binary format
	value_len[in] t]	Size of the amount buff
	Amount[out]	Balance Amount from the card
<b>Return Value</b>	EMV_OK: Success Other: Failed	
<b>Example</b>		

### 3.3. Contactless API

#### 3.3.1. emv\_ep\_contactless\_build\_combination

<b>Prototype</b>	EMV_ERROR emv_ep_contactless_build_combination(EMV_ENTRY_POINT ep, EMV_PAYMENT_PTR payment)	
<b>Description</b>	Build application candidate list	
<b>Parameters</b>	ep[in]	Handle of the EP module.
	payment[out]	Payment outcome info.
<b>Return Value</b>	EMV_OK: Success Other: Failed	
<b>Example</b>		

#### 3.3.2. emv\_ep\_contactless\_application\_select

<b>Prototype</b>	EMV_ERROR emv_ep_contactless_application_select(EMV_ENTRY_POINT ep)	
<b>Description</b>	Application Selection	
<b>Parameters</b>	ep[in]	Handle of the EP module.
<b>Return Value</b>	EMV_OK: Success Other: Failed	
<b>Example</b>		

### 3.3.3. emv\_ep\_contactless\_transaction

<b>Prototype</b>	EMV_ERROR emv_ep_contactless_transaction( EMV_ENTRY_POINT ep, EMV_BOOL other_interface_supported, EMV_PAYMENT_PTR payment);	
<b>Description</b>	Build application candidate list	
<b>Parameters</b>	ep[in]	Handle of the EP module.
	other_interface_supported[in]	EMV_TRUE: support other interface EMV_FALSE: not support
	payment[out]	Payment outcome info
<b>Return Value</b>	EMV_OK: Success Other: Failed	
<b>Example</b>		

### 3.3.4. emv\_ep\_contactless\_transaction\_completion

<b>Prototype</b>	EMV_ERROR emv_ep_contactless_transaction_completion( EMV_ENTRY_POINT ep, EMV_ONLINE_RESULT online_result, EMV_BYTE_CPTR auth_resp_code, EMV_UINT auth_resp_code_len, EMV_BYTE_CPTR issuer_auth_data, EMV_UINT issuer_auth_data_len, EMV_BYTE_CPTR auth_code, EMV_UINT auth_code_len, EMV_BYTE_CPTR script, EMV_UINT script_len, EMV_PAYMENT_PTR payment);	
<b>Description</b>	Completion a Contactless transaction, call this function if online requested.	
<b>Parameters</b>	ep[in]	Handle of the EP module.
	online_result[in]	Result of online process.
	auth_resp_code[in]	Authorization response code
	auth_resp_code_len	Length of the authorization response code

	de_len[in]	
	issuer_auth_data[in]	Issuer authentication data
	issuer_auth_data_len[in]	Length of the issuer authentication data
	auth_code[in]	Authentication code
	auth_code_len[in]	Length of authentication cde
	script[in]	Issuer script
	script_len[in]	Length of the issuer script
	payment	Payment outcome info
<b>Return Value</b>	EMV_OK: Success Other: Failed	
<b>Example</b>		

### 3.3.5. emv\_ep\_contactless\_transaction\_torn\_process

<b>Prototype</b>	EMV_ERROR emv_ep_contactless_transaction_torn_process(EMV_ENTRY_POINT ep, EMV_PAYMENT_PTR payment)	
<b>Description</b>	Transaction torn process	
<b>Parameters</b>	ep[in]	Handle of the EP module.
	Payment[out]	Payment outcome info
<b>Return Value</b>	EMV_OK: Success Other: Failed	
<b>Example</b>		

### 3.3.6. emv\_ep\_contactless\_torn\_clean

<b>Prototype</b>	EMV_ERROR emv_ep_contactless_torn_clean(EMV_ENTRY_POINT ep, EMV_BOOL clean_all);	
<b>Description</b>	Clean all torn records from the kernels.	
<b>Parameters</b>	ep[in]	Handle of the EP module.
	clean_all	EMV_TRUE: clear all torn transaction. EMV_FALSE: clear the timeout torn

	transaction.
<b>Return Value</b>	EMV_OK: Success Other: Failed
<b>Example</b>	

### 3.3.7. emv\_ep\_contactless\_torn\_add

<b>Prototype</b>	EMV_ERROR emv_ep_contactless_torn_add( EMV_ENTRY_POINT ep, EMV_KERNEL_ID kernel_id, EMV_BYTE_CPTR torn_record, EMV_UINT torn_record_len)	
<b>Description</b>	Load torn record to the kernel.	
<b>Parameters</b>	ep[in]	Handle of the EP module.
	kernel_id[in]	Id of the kernel.
	torn_record[in]	Torn transaction Record data
	torn_record_len[in]	Length of the record data
<b>Return Value</b>	EMV_OK: Success Other: Failed	
<b>Example</b>		

## 4. Parameters

### 4.1. CA Public Key Parameter

Format: RID+Index+Exponent+Modules+SHA1

RID	Index	Exponent	Modules	Check Sum
-----	-------	----------	---------	-----------

A000000004	00	03	9C6BE5ADB10B4BE3DCE2099B 4B210672B89656EBA091204F 613ECC623BEDC9C6D77B660E 8BAEEA7F7CE30F1B153879A4 E36459343D1FE47ACDBD41FC D710030C2BA1D9461597982C 6E1BDD08554B726F5EFF7913 CE59E79E357295C321E26D0B 8BE270A9442345C753E2AA2A CFC9D30850602FE6CAC00C6D DF6B8D9D9B4879B2826B042A 07F0E5AE526A3D3C4D22C72B 9EAA52EED8893866F866387A C05A1399	E795CFD4E9812B1C018E85 1BA8E58A16C555B4A7
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Tag list:

Tag Symbol	Tag	length	Format	Description
TAG_PLATFORM_RID	DF808010	5	B	RID
TAG_PLATFORM_CAPK_EXPONENTS	DF808012	1 or 3	B	Exponents of CA public key
TAG_PLATFORM_CAPK_MODULES	DF808011	Max 256	B	Modules of CA public key
TAG_PLATFORM_CAPK_CHECKSUM	DF808014	20	B	SHA1 of the public key

## 4.2. Issuer Certificate Revoke List

Format: RID+Index+Serial Number

RID	Index	Serial Number
A000000004	F8	000010

#### Tag list

Tag Symbol	Tag	Length	Format	Description
TAG_PLATFORM_RID	DF808010	5	B	RID
TAG_CERTIFICATION_AUTHORITY_PUBLIC_KEY_INDEX_TERMINAL	9F22	1	B	Key Index
TAG_PLATFORM_CERT_SERIAL_NUMBER	DF808062	3	B	Serial number of the issuer public key

### 4.3. Exception File List

Format: PAN+PAN Sequence number

PAN	PAN Sequence number
4367427201522445	01

#### Tag list:

Tag Symbol	Tag	Length	Format	Description
TAG_PRIMARY_ACCOUNT_NUMBER	5A	Max 10	B	PAN
TAG_PRIMARY_ACCOUNT_NUMBER_SEQUENCE_NUMBER	5F34	1	B	PAN Sequence number

### 4.4. DRL parameter(VISA)

Format:ID+Status check+zero check+RCTL+CVM RFL+RCFL+Bitmap

ID	Status check	Zero check	RCTL	CVM RFL	RCFL
"01"	01	01	2000	500	1000

#### Tag list

Tag Symbol	Tag	Length	Format	Description
TAG_VISA_PROGRAM_ID	9F5A	1-16	B	Program ID
TAG_PLATFORM_STATUS_CHECK	DF808028	1	B	Status check 00: Enable 01:Disable
TAG_PLATFORM_ZERO_CHECK	DF808029	1	B	Zero check: 00: Disable 01:Option1 02:Option2
TAG_PLATFORM_READER_CONTACTLESS_TRANS_LIMIT	DF80802A	6	N	Contactless transaction limit amount
TAG_PLATFORM_READER_CO	DF80802B	6	N	Floor Limit amount

NTACTLESS_FLOOR_LIMIT				
TAG_PLATFORM_READER_CVM_REQUIRE_LIMIT	DF80802C	6	N	CVM floor limit amount

## 4.5. DRL parameter(AMEX)

Format:ID+Status check+zero check+RCTL+CVM RFL+RCFL+Bitmap

ID	Status check	Zero check	RCTL	CVM RFL	RCFL
"01"	01	01	2000	500	1000

Tag list

Tag Symbol	Tag	Length	Format	Description
TAG_AMEX_DRL_PROGRAM_ID	DF808510	1-16	B	Program ID
TAG_PLATFORM_STATUS_CHECK	DF808028	1	B	Status check 00: Enable 01:Disable
TAG_PLATFORM_ZERO_CHECK	DF808029	1	B	Zero check: 00: Disable 01:Option1 02:Option2
TAG_PLATFORM_READER_CONTACTLESS_TRANS_LIMIT	DF80802A	6	N	Contactless transaction limit amount
TAG_PLATFORM_READER_CONTACTLESS_FLOOR_LIMIT	DF80802B	6	N	Floor Limit amount
TAG_PLATFORM_READER_CVM_REQUIRE_LIMIT	DF80802C	6	N	CVM floor limit amount

## 4.6. Transaction Parameters

Tag list:

Tag Symbol	Tag	Length	Format	Description
TAG_TRANSACTION_TYPE	9C	6	B	Transaction type
TAG_AMOUNT_AUTHORISED_NUMERIC	9F02	6	BCD	Authorized Number
TAG_AMOUNT_OTHER_NUMERIC	9F03	6	BCD	Authorized Number Other
TAG_TRANSACTION_CURRENCY_CODE	5F2A	2	B	Transaction Currency Code

TAG_TRANSACTION_CURRENCY_EXPONENT	5F36	1	B	Transaction Currency Exponent
TAG_TRANSACTION_REFERENCE_CURRENCY_CODE	9F3C	2	B	Transaction reference Currency Code
TAG_TRANSACTION_REFERENCE_CURRENCY_EXPONENT	9F3D	1	B	Transaction reference Currency Exponent
TAG_ACCOUNT_TYPE	5F57	1	B	Account type
TAG_MC_TRANSACTION_CATEGORY_CODE	9F53	1	B	Transaction category code
TAG_MC_BALANCE_READ_BEFORE_GAC	DF8104	6	BCD	Balance read before GAC
TAG_MC_BALANCE_READ_AFTER_GAC	DF8105	6	BCD	Balance read after GAC
TAG_MC_MERCHANT_CUSTOM_DATA	9F7C	20	B	Merchant custom data

For example:

9C01009F02060000000002005F2A0208405F3601029F3C0208409F3D01025F57009F5301019F7C143132333435363738393031323334353637383930.

## 4.7. Kernel Parameters

### 4.7.1. EMV&PBOC

Tag List.

Tag Symbol	Tag	Length	Format	Description
TAG_PLATFORM_KERNEL_ID	DF808000	1	B	Kernel ID 00: EMV&PBOC
TAG_APPLICATION_IDENTIFIER_C_TERMINAL	9F06	5-16	B	AID
TAG_PLATFORM_AID_ASI	DF808060	1	B	ASI
TAG_PLATFORM_APP_PARAMETER_DATA	DF808002	Max 256.	B	Application parameter
TAG_ACQUIRER_IDENTIFIER	9F01	6	N	Acquire ID
TAG_APPLICATION_VERSION_NUMBER_TERMINAL	9F09	2	B	Application version
TAG_MERCHANT_IDENTIFIER	9F16	15	ANS	Merchant ID
TAG_MERCHANT_NAME_AND_LOCATION	9F4E	Max 256.	ANS	Merchant name and location
TAG_TERMINAL_IDENTIFICATION	9F1C	8	AN	Terminal ID
TAG_TERMINAL_COUNTRY_CODE	9F1A	2	N	Terminal country code



TAG_TERMINAL_TYPE	9F35	1	N	Terminal Type
TAG_TERMINAL_CAPABILITIES	9F33	3	B	<p>Terminal capabilities</p> <p>B1b8:Manual key entry</p> <p>B1b7:Magnetic stripe</p> <p>B1b6:ICC with contact</p> <p>Byte1 other bits: RFU</p> <p>B2b8:Plain text PIN for ICC verify</p> <p>B2b7:Enciphered PIN for online verify</p> <p>B2b6:Signature</p> <p>B2b5:Enciphered PIN for offline verify</p> <p>B2B4:No CVM required</p> <p>Byte2 other bits: RFU</p> <p>B3b8:SDA</p> <p>B3b8:DDA</p> <p>B3b8:Card capture</p> <p>B3b8:RFU</p> <p>B3b8:CDA</p> <p>Byte3 other bits: RFU</p>
TAG_ADDITIONAL_TERMINAL_CAPABILITIES	9F40	5	B	Additional terminal capabilities
TAG_TERMINAL_FLOOR_LIMIT	9F1B	4	B	Terminal floor limit
TAG_TERMINAL_RISK_MANAGEMENT_DATA	9F1D	1-8	B	Terminal risk management data
TAG_PLATFORM_KERNEL_CONFIG	DF808061	6	B	<p>Kernel configuration:</p> <p>Byte1: indicate CDA method type</p> <p>00: Method1</p> <p>01:Method2</p> <p>02:Method3</p> <p>03:Method4</p> <p>Byte2-3:Max Script Length</p> <p>B4b8: Support SM</p> <p>B4b7: Skip TAC/IAC Default</p> <p>B4b6: Get Pin Try Counter</p> <p>B4b5: Bypass PIN Entry</p> <p>B4b4: Subsequent Bypass PIN Entry.</p> <p>B4b3: Online Data Capture</p>

				B4b2: Batch Data Capture B4b1: Force Approve  B5b8: Force Online Byte5 other bis: RFU Byte6:RFU(00) For instance: 000080FD8000
TAG_PLATFORM_TAC_DENIAL	DF808020	5	B	TAC Denial
TAG_PLATFORM_TAC_DEFAULT	DF808021	5	B	TAC Default
TAG_PLATFORM_TAC_ONLINE	DF808022	5	B	TAC Online
TAG_PLATFORM_TRM_TARGET_PERCENT	DF808023	1	B	Target percent
TAG_PLATFORM_TRM_MAX_TARGET_PERCENT	DF808024	1	B	Max Target Percent
TAG_PLATFORM_TRM_THRESHOLD_VALUE	DF808025	6	N	Threshold Value
TAG_PLATFORM_DEFAULT_DDOL	DF808026	Max 256.	B	Default DDOL For instance: 9F3704
TAG_PLATFORM_DEFAULT_TDOL	DF808027	Max 256.	B	Default TDOL For instance: 9F3704

For example.

DF80800001009F0606A00000999904DF8080600101DF80800281B49F01060123456789109F090200969F160F303030303030303030303030309F150212349F4E0653484F5020319F1C0846726F6E743132339F1A0208409F3501229F3303E0F8C89F4005FF00F0A001DF80806106000080FD8000DF808020050000000000DF808021050000000000DF8080220500000000009F1B0400015000DF8080230100DF8080240100DF808025060000000000DF808026039F3704DF808027039F37049F1D01019F7B06000000010000

## 4.7.2. QPBOC

Tag List.

Tag Symbol	Tag	Length	Format	Description
TAG_QPBOC_CARD_FUNC_INDICATOR	DF61	1	B	Card function indicator Byte 1. Bit 8: 1=Card supports R-MAC protection for extended

				<p>application logging data</p> <p>Bit:7:1=Card supports online ODA function</p> <p>Bit 6~3: RFU(00000)</p> <p>Bit 2:1=The card supports both Segmented Chargeback and Offline Pre-Authorisation; Bit 2:1=The card supports both Segmented Chargeback and Offline Pre-Authorisation.</p> <p>Bit 1: 1 means the card only supports segmented debit function.</p>
TAG_QPBOC_SECONDARY_APPLICATION_CURRENCY_CODE	DF71	2	B	Second application currency code
TAG_QPBOC_APPLICATION_CURRENCY_CODE	9F51	2	B	Application currency code
TAG_QPBOC_SM_INDICATOR	DF69	1	B	SM Indicator
TAG_QPBOC_REPRESENT_TIMEOUT	DF808200	4	B	Torn Present TimeOut
TAG_QPBOC_MAX_TORN_RECORD	DF808201	1	B	Max Tron Record
TAG_QPBOC_TORN_RECORD_LIFETIME	DF808202	4	B	Torn Life Time
TAG_QPBOC_UICC_ERROR	DF808203	2	B	uicc error
TAG_QPBOC_APPLICATION_PROGRAM_IDENTIFIER	9F5A	1-16	B	Application program identifier
TAG_QPBOC_EC_BALANCE	9F5D	6	CN	Available Offline Spending Amount (AOSA)
TAG_QPBOC_PRODUCT_ID_INFO	9F36	16	B	Product ID information
TAG_QPBOC_CARD_ADDITIONAL_PROCESS	9F68	4	B	<p>Card Additional Process (CAP)</p> <p>Byte 1:</p> <p>bit 8 :1-Support for micro-checks</p> <p>0-No support for micro-checks</p> <p>bit 7 : 1-Support for micro and CT TA checks</p> <p>0-No Support for micro and CTTA checks</p> <p>bit 6:1-Support for micro or CTTA checks</p> <p>0-No Support for micro or CTTA ch</p>

				<p>ecks</p> <p>bit 5:1-Support for new card checking 0-No Support for new card checking</p> <p>bit 4:1-Support PIN Retries over Checks 0-No Support PIN Retries over Checks</p> <p>bit 3:1-Allow offline transactions with currency mismatches 0-Do not allow offline transactions with currency mismatches</p> <p>bit 2:1-Card Preferred Contact Debit/Credit Online 0-Card does not select contact debit/credit on-line</p> <p>bit 1 :1&gt;Returns the amount of available offline spending 0-No return of available offline spending amount</p> <p>Byte 2:</p> <p>bit 8:1-Support prepayment 0-No Support prepayment</p> <p>Bit 7:1-Do not allow transactions in unmatched currencies 0-Allow transactions in mismatched currencies</p> <p>Bit 6:1-Reject the transaction if it is a new card and the terminal only supports offline. 0-If it is a new card and the terminal only supports offline does not reject the transaction</p> <p>Bit 5:1-qPBOC offline approved transactions, card records transaction logs 0-qPBOC Transactions approved offline, cards do not record transaction logs</p> <p>Bit 4:1:RFU</p> <p>Byte 3:</p> <p>Bit 8:1-Transactions in matching currencies support online PINs 0-Transactions in matching currencies do not support online</p>
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				<p>PINs</p> <p>Bit 7:1-Online PINs are supported for transactions with unmatched currencies</p> <p>0-Online PINs are not supported for transactions with unmatched currencies</p> <p>Bit 6:1-Card requires CVM for mismatched currency transactions</p> <p>0-Card does not require CVM for mismatched currency transactions</p> <p>Bit 5:1 - Signature support</p> <p>0 - Signature not supported</p> <p>Bit 4-1:RFU</p> <p>Byte 4:RFU</p>
TAG_QPBOC_CARD_AUTH_DATA	9F69	8-16	B	<p>Card Authentication Related Data</p> <p>Byte 1: DDA version number 01" in this specification)</p> <p>Bytes 2-5: Card Unpredictability</p> <p>Bytes 6-7: Card Transaction Attributes</p> <p>Byte 8: RFU(00)</p>
TAG_QPBOC_CUSTOMER_EXCLUSIVE_DATA	9F7C	1-32	B	Customer Exclusive Data (CED)

### 4.7.3. PAYPASS

Tag List.

Tag Symbol	Tag	Length	Format	Description
TAG_PLATFORM_KERNEL_ID	DF808000	1	B	Kernel ID 02: PAYPASS
TAG_TRANSACTION_TYPE	9C	1	B	Transaction type
TAG_APPLICATION_IDENTIFIER_C_TERMINAL	9F06	5-16	B	AID
TAG_PLATFORM_AID_ASI	DF808060	1	B	ASI
TAG_PLATFORM_APP_PARAMETER_DATA	DF808002	Max 256.	B	Application parameter
TAG_ACQUIRER_IDENTIFIER	9F01	6	N	Acquire ID
TAG_APPLICATION_VERSION	9F09	2	B	Application version

_NUMBER_TERMINAL				
TAG_MERCHANT_IDENTIFIER	9F16	15	ANS	Merchant ID
TAG_MERCHANT_CATEGORY_CODE	9F15	2	N	Merchant Category Code
TAG_MERCHANT_NAME_AND_LOCATION	9F4E	Max 256.	ANS	Merchant name and location
TAG_TERMINAL_IDENTIFICATION	9F1C	8	AN	Terminal ID
TAG_TERMINAL_COUNTRY_CODE	9F1A	2	N	Terminal country code
TAG_INTERFACE_DEVICE_IFD_SERIAL_NUMBER	9F1E	8	AN	Interface Device (IFD) Serial Number
TAG_TERMINAL_TYPE	9F35	1	N	Terminal Type
TAG_TERMINAL_CAPABILITIES	9F33	3	B	<p>Terminal capabilities</p> <p>B1b8:Manual key entry</p> <p>B1b7:Magnetic stripe</p> <p>B1b6:ICC with contact</p> <p>Byte1 other bits: RFU</p> <p>B2b8:Plain text PIN for ICC verify</p> <p>B2b7:Enciphered PIN for online verify</p> <p>B2b6:Signature</p> <p>B2b5:Enciphered PIN for offline verify</p> <p>B2B4:No CVM required</p> <p>Byte2 other bits: RFU</p> <p>B3b8:SDA</p> <p>B3b8:DDA</p> <p>B3b8:Card capture</p> <p>B3b8:RFU</p> <p>B3b8:CDA</p> <p>Byte3 other bits: RFU</p>
TAG_ADDITIONAL_TERMINAL_CAPABILITIES	9F40	5	B	Additional terminal capabilities
TAG_TERMINAL_RISK_MANAGEMENT_DATA	9F1D	1-8	B	Terminal risk management data
TAG_MC_READER_CONTACTLESS_TRANSACTION_LIMIT_ON_DEVICE_CVM	DF8125	6	B	Reader Contactless transaction limit (On-deviceCVM)
TAG_MC_READER_CONTACTLESS_TRANSACTION_LIMIT_NO_DEVICE_CVM	DF8124	6	B	Reader Contactless transaction limit (NoOn-device CVM)

TAG_MC_READER_CONTACTLESS_FLOOR_LIMIT	DF8123	6	B	Reader Contactless floor limit
TAG_MC_READER_CVM_REQUIRED_LIMIT	DF8126	6	B	Reader CVM required limit
TAG_MC_MOBILE_SUPPORT_INDICATOR	9F7E	1	B	Mobile support indicator
TAG_MC_KERNEL_CONFIGURATION	DF811B	1	B	Kernel configuration B1b8:Only EMV support B1b7:Only MAG support B1b6:On device cardholder verify support B1b5:RRP support Other bits:RFU
TAG_MC_MAG_STRIPE_APP_VERSION	9F6D	2	B	Mag-stripe application version number(Reader)
TAG_MC_DEFAULT_UDOL	DF811A	3	B	Default UDOL
TAG_MC_MAG_STRIPE_CVM_CAPABILITY_CVM_REQUIRED	DF811E	1	B	Mag-stripe CVM Capability CVM Required 10: Signature 20:Enciphered PIN for online verify F0:N/A
TAG_MC_MAG_STRIPE_CVM_CAPABILITY_NO_CVM_REQUIRED	DF812C	1	B	Mag-stripe CVM Capability No CVM Required 10: Signature 20:Enciphered PIN for online verify F0:N/A
TAG_MC_SECURITY_CAPABILITY	DF811F	1	B	Security capability B1b8:SDA B1b7:DDA B1b6:Card capture B1b5:RFU B1b4:CDA Other bits: RFU
TAG_MC_CARD_DATA_INPUT_CAPABILITY	DF8117	1	B	Card data input capability B1b8:Manual key entry B1b7:Magnetic stripe B1b6:ICC with contacts Other bits: RFU
TAG_MC_CVM_CAPABILITY_CVM_REQUIRED	DF8118	1	B	CVM capability CVM required B1b8:Plain text PIN for ICC verify B1b7:Enciphered PIN for online verify

				B1b6:Signature B1b5:Enciphered PIN for offline verify B1b4:No CVM required Other bits: RFU
TAG_MC_CVM_CAPABILITY_NO_CVM_REQUIRED	DF8119	1	8	CVM capability no CVM required B1b8:Plain text PIN for ICC verify B1b7:Enciphered PIN for online verify B1b6:Signature B1b5:Enciphered PIN for offline verify B1b4:No CVM required Other bits: RFU
TAG_MC_MAX_LIFETIME_OF_TORN_TRANSACTION_LOG_RECORD	DF811C	2	B	Max life time of torn transaction log record
TAG_MC_MAX_NUMBER_OF_TORN_TRANSACTION_LOG_RECORDS	DF811D	1	B	Max number of torn transaction log records
TAG_MC_TERMINAL_ACTION_CODE_DEFAULT	DF8120	5	B	Terminal action code default
TAG_MC_TERMINAL_ACTION_CODE_DENIAL	DF8121	5	B	Terminal action code denial
TAG_MC_TERMINAL_ACTION_CODE_ONLINE	DF8122	5	B	Terminal action code online
TAG_MC_DSVN_TERM	DF810D	Max 255.	B	DSVN Term
TAG_MC_DS_AC_TYPE	DF8108	1	B	DSAC Type
TAG_MC_DS_INPUT_CARD	DF60	8	B	DS Input(Card)
TAG_MC_DS_INPUT_TERM	DF8109	8	B	DS Input(Term)



TAG_MC_DS_ODS_INFO	DF62	1	B	DSODS Info
TAG_MC_DS_ODS_INFO_FOR_READER	DF810A	1	B	DSODS Info for reader
TAG_MC_DS_ODS_TERM	DF63	1-160	B	DSODS Term

For example:

DF80800001029C01009F0607A0000000041010DF8080600101DF80800281DA9F01009F090200029  
F16009F150212349F4E009F1C009F1A0200569F1E083832313030303031DF812506000000050000D  
F812406000000030000DF812306000000010000DF812606000000010009F7E0100DF811B01209F6  
D020001DF811A039F6A04DF811E0110DF812C0100DF811F0108DF81170100DF81180160DF81190  
108DF811C020000DF811D0100DF8120050000000000DF8121050000000000DF8122050000000000  
9F350122DF810D00DF810800DF6000DF810900DF6200DF810A00DF63009F1D086CFF000000000000  
09F33009F400500000000000

#### 4.7.4. PAYWAVE

Tag List:

Tag Symbol	Tag	Length	Format	Description
TAG_PLATFORM_KERNEL_ID	DF808000	1	B	Kernel ID 03: PAYWAVE
TAG_TRANSACTION_TYPE	9C	1	B	Transaction type
TAG_APPLICATION_IDENTIFIE R_C_TERMINAL	9F06	5-16	B	AID
TAG_PLATFORM_AID_ASI	DF808060	1	B	ASI
TAG_PLATFORM_APP_PARA M_DATA	DF808002	Max 256.	B	Application parameter
TAG_ACQUIRER_IDENTIFIER	9F01	6	N	Acquire ID
TAG_APPLICATION_VERSION _NUMBER_TERMINAL	9F09	2	B	Application version
TAG_MERCHANT_IDENTIFIER	9F16	15	ANS	Merchant ID
TAG_MERCHANT_CATEGORY _CODE	9F15	2	N	Merchant category code
TAG_MERCHANT_NAME_AN D_LOCATION	9F4E	Max 256.	ANS	Merchant name and location
TAG_TERMINAL_IDENTIFICAT ION	9F1C	8	AN	Terminal ID
TAG_TERMINAL_COUNTRY_C ODE	9F1A	2	N	Terminal country code

TAG_INTERFACE_DEVICE_IFD_SERIAL_NUMBER	9F1E	8	AN	Interface Device (IFD) Serial Number
TAG_TERMINAL_FLOOR_LIMIT	9F1B	4	B	Terminal floor limit.
TAG_PLATFORM_KERNEL_CONFIG	DF808061	3	B	<p>Kernel configuration.</p> <p>B1b8: CVM17 fallback to MSD legacy</p> <p>B1b7: Enable MSD CVM17</p> <p>B1b6: MSD formatting track2 data</p> <p>B1b5: MSD constructing track1 data</p> <p>B1b4: DRL</p> <p>B1b3: Manual cash check</p> <p>B1b2: Cashback check</p> <p>B1b1: exception file check</p> <p>B2b8: Key Revocation</p> <p>Byte2 other bits: RFU</p> <p>B3b8: Status check</p> <p>B3b7: Zero amount check</p> <p>B3b6: Contactless transaction limit check</p> <p>B3b5: Contactless floor limit check</p> <p>B3b4: CVM required limit check</p> <p>Byte3 other bits: RFU</p>
TAG_TTQ	9F66	4	B	<p>Terminal transaction qualifiers (TTQ)</p> <p>B1b8: Mag-stripe mode</p> <p>B1b7: RFU</p> <p>B1b6: EMV mode</p> <p>B1b5: EMV contact mode</p> <p>B1b4: offline only</p> <p>B1b3: online pin</p> <p>B1b2: signature</p> <p>B1b1: ODA for online authentication</p> <p>B2b8: online cryptogram</p> <p>B2b7: CVM required</p> <p>B2b6: offline pin</p> <p>Byte2 other bits: RFU</p> <p>B3b8: issuer script</p>

				B3b7:mobile CVM Byte3 other bits: RFU  Byte4: RFU(00)
TAG_PLATFORM_STATUS_CHECK	DF808028	1	B	Status check
TAG_PLATFORM_ZERO_CHECK	DF808029	1	B	Zero check
TAG_PLATFORM_READER_CONTACTLESS_TRANS_LIMIT	DF80802A	6	N	Reader Contactless transaction limit
TAG_PLATFORM_READER_CONTACTLESS_FLOOR_LIMIT	DF80802B	6	N	Reader Contactless floor limit
TAG_PLATFORM_READER_CVM_REQUIRE_LIMIT	DF808028C	6	N	Reader CVM require limit

For example:

DF80800001039C01009F0607A0000000031010DF8080600101DF808002818F9F010630303030303  
09F090201569F160F3030303030303030303030303030309F150200019F4E0942616E64204361726  
49F1C08504F5330303030319F1A0208409F1E085465726D696E616CDF808061030780F89F6604360  
0C000DF8080280101DF80802901009F1B0400002710DF80802A06000000015000DF80802B060000  
00002700DF80802C06000000002200

#### 4.7.5. JCB

Tag Symbol	Tag	Length	Format	Description																																																																																																
TAG_JCB_CARDHOLDER_VEIFICATION_STATUS	9F50	1	B	<div>Cardholder Verification Status</div> <table><tr><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>Meaning</th></tr><tr><td>0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>RFU</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td></td><td></td><td></td><td></td><td>No CVM required</td></tr><tr><td>0</td><td>0</td><td>1</td><td></td><td></td><td></td><td></td><td></td><td>Signature (paper) is to be performed</td></tr><tr><td>0</td><td>1</td><td>0</td><td></td><td></td><td></td><td></td><td></td><td>Enciphered PIN verified online is to be performed</td></tr><tr><td>0</td><td>1</td><td>1</td><td></td><td></td><td></td><td></td><td></td><td>On-Device CVM has been successfully performed – method used is indicated in bits b4-b1</td></tr><tr><td>1</td><td>0</td><td>0</td><td></td><td></td><td></td><td></td><td></td><td rowspan="3">RFU</td></tr><tr><td>1</td><td>0</td><td>1</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1</td><td>1</td><td>0</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1</td><td>1</td><td>1</td><td></td><td></td><td></td><td></td><td></td><td rowspan="2">On-Device CVM selected: 0000b – No On-Device CVM performed 0001b – Confirmation Code entered on Mobile Device Other values – RFU</td></tr><tr><td></td><td></td><td></td><td>x</td><td>x</td><td>x</td><td>x</td><td></td></tr></table>	b8	b7	b6	b5	b4	b3	b2	b1	Meaning	0								RFU	0	0	0	0					No CVM required	0	0	1						Signature (paper) is to be performed	0	1	0						Enciphered PIN verified online is to be performed	0	1	1						On-Device CVM has been successfully performed – method used is indicated in bits b4-b1	1	0	0						RFU	1	0	1						1	1	0						1	1	1						On-Device CVM selected: 0000b – No On-Device CVM performed 0001b – Confirmation Code entered on Mobile Device Other values – RFU				x	x	x	x	
b8	b7	b6	b5	b4	b3	b2	b1	Meaning																																																																																												
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			x	x	x	x																																																																																														
TAG_JCB_TERMINAL_COMPATIBILITY_INDICATOR	9F52	1	B	<div>Terminal Compatibility Indicator</div> <div>Bit2: fixed to 1(EMV Mode Supported)</div> <div>Bit1: Fixed to 0</div>																																																																																																

				<div>Other bits: RFU</div> <table><tr><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>Meaning</th></tr><tr><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td></td><td>Each bit RFU</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td><td></td><td>EMV Mode Supported (fixed to 1b)</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>0</td><td>fixed to 0b</td></tr></table>	b8	b7	b6	b5	b4	b3	b2	b1	Meaning	x	x	x	x	x	x	x		Each bit RFU							1		EMV Mode Supported (fixed to 1b)								0	fixed to 0b																																																																																										
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TAG_JCB_TERMINAL_INTERCHANGE_PROFILE_DYNAMIC	9F53	3	B	<div>Terminal Interchange Profile(Dynamic)</div> <div>TIP Byte 1 (Leftmost)</div> <table><tr><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>Meaning</th></tr><tr><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>CVM required by reader / N/A<sup>17</sup></td></tr><tr><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td>Signature supported</td></tr><tr><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td><td>Online PIN supported</td></tr><tr><td></td><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td><td>On-Device CVM supported</td></tr><tr><td></td><td></td><td></td><td></td><td>0</td><td></td><td></td><td></td><td>RFU</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td>1</td><td></td><td></td><td>Reader is a Transit Reader</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td><td></td><td>EMV contact chip supported</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td><td>(Contact Chip) Offline PIN supported</td></tr></table> <div>TIP Byte 2</div> <table><tr><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>Meaning</th></tr><tr><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Issuer Update supported<sup>18</sup></td></tr><tr><td></td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>Each bit RFU</td></tr></table> <div>TIP Byte 3 (Rightmost)</div> <table><tr><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>Meaning</th></tr><tr><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>Each bit RFU</td></tr></table>	b8	b7	b6	b5	b4	b3	b2	b1	Meaning	1								CVM required by reader / N/A <sup>17</sup>		1							Signature supported			1						Online PIN supported				1					On-Device CVM supported					0				RFU						1			Reader is a Transit Reader							1		EMV contact chip supported								1	(Contact Chip) Offline PIN supported	b8	b7	b6	b5	b4	b3	b2	b1	Meaning	1								Issuer Update supported <sup>18</sup>		x	x	x	x	x	x	x	Each bit RFU	b8	b7	b6	b5	b4	b3	b2	b1	Meaning	x	x	x	x	x	x	x	x	Each bit RFU
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TAG_JCB_MAGSTRIPE_DATA_OBJECT_LIST	9F5C	Up. 256	B	Magstripe Data Object List																																																																																																																														
TAG_JCB_OFFLINE_BALANCE TACTLESS_READER_CAPABILITIES	9F5F	6	N	Offline Balance																																																																																																																														
TAG_JCB_ISSUER_UPDATE_PARAMETER	9F60	1	B	<div>Issuer Update Parameter</div> <table><tr><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>Meaning</th></tr><tr><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td></td><td>Each bit RFU</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td>0</td><td>0</td><td>Issuer Update is not expected, card can be removed</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td>0</td><td>1</td><td>Issuer Update is expected, card shall be kept in RF field during authorisation process</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td><td>0</td><td>Issuer Update is expected, card shall be presented again if necessary after authorisation process</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td><td>1</td><td>RFU</td></tr></table>	b8	b7	b6	b5	b4	b3	b2	b1	Meaning	x	x	x	x	x	x	x		Each bit RFU							0	0	Issuer Update is not expected, card can be removed							0	1	Issuer Update is expected, card shall be kept in RF field during authorisation process							1	0	Issuer Update is expected, card shall be presented again if necessary after authorisation process							1	1	RFU																																																																								
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TAG_JCB_DEVICE_INFO	9F6E	4	B	<div>Device Information</div> <div>Byte 1 Device type</div> <table><tr><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>Meaning</th></tr><tr><td>x</td><td>x</td><td>x</td><td></td><td></td><td></td><td></td><td></td><td>Device Factor Version In this version, this value is '001'</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Device Factor Type: 00000b – Card 00001b – Smart Phone 00010b – Key fob 00011b – Watch 00100b – Mobile Tag 00101b – Wristband 00110b – Mobile Phone case or Sleeve 00111b – Glasses 01000b – Tablet Others are RFU</td></tr></table> <div>Byte 2 Application Location</div> <table><tr><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>Meaning</th></tr><tr><td>x</td><td>x</td><td>x</td><td></td><td></td><td></td><td></td><td></td><td>RFU</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>SE Type: 00001b – IC CHIP 00010b – SIM 00011b – Embedded SIM 00100b – MicroSD 00101b – IC tag 00110b – Cloud SE(HCE) Others are RFU</td></tr></table> <div>Byte 3-4 RFU</div> <table><tr><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>Meaning</th></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>RFU</td></tr></table>	b8	b7	b6	b5	b4	b3	b2	b1	Meaning	x	x	x						Device Factor Version In this version, this value is '001'									Device Factor Type: 00000b – Card 00001b – Smart Phone 00010b – Key fob 00011b – Watch 00100b – Mobile Tag 00101b – Wristband 00110b – Mobile Phone case or Sleeve 00111b – Glasses 01000b – Tablet Others are RFU	b8	b7	b6	b5	b4	b3	b2	b1	Meaning	x	x	x						RFU									SE Type: 00001b – IC CHIP 00010b – SIM 00011b – Embedded SIM 00100b – MicroSD 00101b – IC tag 00110b – Cloud SE(HCE) Others are RFU	b8	b7	b6	b5	b4	b3	b2	b1	Meaning	0	0	0	0	0	0	0	0	RFU																																																						
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TAG_JCB_PARTNER_DISC_DA	9F7C	1-64	B	Partner Discretionary Data																																																																																																																														

TA				<table><tr><th>Data</th><th>Length (nibbles)</th><th>Digit #</th><th>Value</th></tr><tr><td>PDD Type Indicator</td><td>1</td><td>1</td><td>0: Set to "0", if this parameter is not used 1: Japanese Issuer 2: Non Japanese Issuer 3-F: RFU</td></tr><tr><td>Category Code</td><td>1</td><td>2</td><td>If PDD Type indicator is "1", this field shall be set to Issuer's Category Code. If PDD Type indicator is "0" or "2", this field shall be set to "0".</td></tr><tr><td>Company Code / Country Code</td><td>4</td><td>3-6</td><td>If PDD Type indicator is "0", this field shall be set to "0000". If PDD Type indicator is "1", this field shall be set to Issuer's Company Code. If PDD Type indicator is "2", this field shall be set to Issuer Country Code according to ISO 3166.</td></tr><tr><td>Issuer Discretionary Field</td><td>58</td><td>7-64</td><td>If PDD Type indicator is "0", this field shall be set to All "0". If PDD Type indicator is "1" or "2", this field shall be set to issuer proprietary data elements.</td></tr></table>	Data	Length (nibbles)	Digit #	Value	PDD Type Indicator	1	1	0: Set to "0", if this parameter is not used 1: Japanese Issuer 2: Non Japanese Issuer 3-F: RFU	Category Code	1	2	If PDD Type indicator is "1", this field shall be set to Issuer's Category Code. If PDD Type indicator is "0" or "2", this field shall be set to "0".	Company Code / Country Code	4	3-6	If PDD Type indicator is "0", this field shall be set to "0000". If PDD Type indicator is "1", this field shall be set to Issuer's Company Code. If PDD Type indicator is "2", this field shall be set to Issuer Country Code according to ISO 3166.	Issuer Discretionary Field	58	7-64	If PDD Type indicator is "0", this field shall be set to All "0". If PDD Type indicator is "1" or "2", this field shall be set to issuer proprietary data elements.																																																																																																										
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TAG_JCB_COMBINATION_OPTIONS	DF808600	2	B	<div>Combination Options</div> <div>Combination Options Byte 1 (Leftmost)</div> <table><tr><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>Meaning</th></tr><tr><td>0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>RFU</td></tr><tr><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td>Status Check supported</td></tr><tr><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td><td>Offline Data Authentication supported</td></tr><tr><td></td><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td><td>Exception File Check required<sup>16</sup></td></tr><tr><td></td><td></td><td></td><td></td><td>1</td><td></td><td></td><td></td><td>Random Transaction Selection supported</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td>0</td><td></td><td></td><td>fixed to 0b</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td><td></td><td>EMV Mode Supported (fixed to 1b)</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td><td>Legacy Mode Supported</td></tr></table> <div>Combination Options Byte 2 (Rightmost)</div> <table><tr><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>Meaning</th></tr><tr><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>Each bit RFU</td></tr></table>	b8	b7	b6	b5	b4	b3	b2	b1	Meaning	0								RFU		1							Status Check supported			1						Offline Data Authentication supported				1					Exception File Check required <sup>16</sup>					1				Random Transaction Selection supported						0			fixed to 0b							1		EMV Mode Supported (fixed to 1b)								1	Legacy Mode Supported	b8	b7	b6	b5	b4	b3	b2	b1	Meaning	x	x	x	x	x	x	x	x	Each bit RFU																											
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TAG_JCB_TERMINAL_INTERCHANGE_PROFILE_STATIC	DF808601	3	B	<div>Terminal Interchange Profile(Static)</div> <div>TIP Byte 1 (Leftmost)</div> <table><tr><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>Meaning</th></tr><tr><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>CVM required by reader / N/A<sup>17</sup></td></tr><tr><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td>Signature supported</td></tr><tr><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td><td>Online PIN supported</td></tr><tr><td></td><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td><td>On-Device CVM supported</td></tr><tr><td></td><td></td><td></td><td></td><td>0</td><td></td><td></td><td></td><td>RFU</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td>1</td><td></td><td></td><td>Reader is a Transit Reader</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td><td></td><td>EMV contact chip supported</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td><td>(Contact Chip) Offline PIN supported</td></tr></table> <div>TIP Byte 2</div> <table><tr><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>Meaning</th></tr><tr><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Issuer Update supported<sup>18</sup></td></tr><tr><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>Each bit RFU</td></tr></table> <div>TIP Byte 3 (Rightmost)</div> <table><tr><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th>Meaning</th></tr><tr><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>x</td><td>Each bit RFU</td></tr></table>	b8	b7	b6	b5	b4	b3	b2	b1	Meaning	1								CVM required by reader / N/A <sup>17</sup>		1							Signature supported			1						Online PIN supported				1					On-Device CVM supported					0				RFU						1			Reader is a Transit Reader							1		EMV contact chip supported								1	(Contact Chip) Offline PIN supported	b8	b7	b6	b5	b4	b3	b2	b1	Meaning	1								Issuer Update supported <sup>18</sup>	x	x	x	x	x	x	x	x	Each bit RFU	b8	b7	b6	b5	b4	b3	b2	b1	Meaning	x	x	x	x	x	x	x	x	Each bit RFU
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TAG_JCB_REMOVAL_TIMEOUT	DF808602	1	B	Removal Timeout																																																																																																																														
TAG_JCB_TRANS_MODE	DF808603	1	B	Transaction Mode enum { JCB_UNDEFINED, JCB_EMV_MODE, JCB_MAGSTRIPE_MODE, JCB_LEGACY_MODE }																																																																																																																														

#### 4.7.6. American Express

Tag List:

Tag Symbol	Tag	Length	Format	Description
TAG_APPLICATION_DUAL_CURRENCY_CODE	9F50	2	N	Application Dual Currency Code
TAG_MEMBERSHIP_PRODUCT_IDENTIFIER	9F5A	Var.0-8	AN	Membership Product Identifier
TAG_PRODUCT_MEMBERSHIP_NUMBER	9F5B	Var.0-32	AN	PRODUCT Membership Number
TAG_AMEX_CONTACTLESS_READER_CAPABILITIES	9F6D	1	B	Contactless Reader Capabilities
TAG_AMEX_ENHANCED_CONTACTLESS_READER_CAPABILITIES	9F6E	4	B	Enhanced Contactless Reader Capabilities
TAG_AMEX_CARD_INTERFACE_AND_PAYMENT_CAPABILITIES	9F70	2	B	Card Interface and Payment Capabilities
TAG_AMEX_MOBILE_CVM_RESULT	9F71	3	B	Mobile CVM Results
TAG_AMEX_UNPREDICABLE_NUMBER_RANGE	DF808500	1	B	Unpredictable Number Range
TAG_AMEX_DRL_PROGRAM_ID	DF808510	1	B	DRL Program ID

#### 4.7.7. Discover

Tag List:

Tag Symbol	Tag	length	Format	Description
TAG_DISCOVER_TRACK1_DATA	56	Var.0-256	N	Track1 data
TAG_DISCOVER_OFFLINE_BALANCE	D1	6	N	Offline balance
TAG_DISCOVER_CL_ACO	C0	2	B	Contactless Application Configuration Options
TAG_DISCOVER_CARD_PROCESSING_REQUIREMENTS	9F71	2	B	Card processing requirement
TAG_DISCOVER_PAYMENT_APPLICATION_VERSION_NUMBER	9F7d	2	B	Payment application version number
TAG_DISCOVER_DCVV_FOR_	9F7E	3	B	DCVV For zip v2 or dpas ms mode

ZIP_V2_OR_DPAS_MS_MODE				
TAG_DISCOVER_DCVV_FOR_ZIP	9F80	3	B	DCVV for zip
TAG_DISCOVER_ZERO_OFFLINE_CHECK	DF808A01	1	B	Zero offline check

## 4.7.8. RuPay

### 4.7.8.1. Service Parameter

Tag Symbol	Tag	length	Format	Description
TAG_RUPAY_SERVICE_AVAILABILITY_INFO	DF03	1	B	Service Availability Info
TAG_RUPAY_SERVICE_DIRECTORY	DF07	Var.0-256	B	Service Directory
TAG_RUPAY_SERVICE_MANAGEMENT_INFO	DF15	2	B	Service Management Information
TAG_RUPAY_SERVICE_ID	DF16	2	B	Service ID
TAG_RUPAY_SERVICE_ATC	DF20	2	B	Service ATC
TAG_RUPAY_SERVICE_SUMMARY	DF22	8	B	Service Summary
TAG_RUPAY_SERVICE_SIGNATURE	DF23	8	B	Service Signature
TAG_RUPAY_SERVICE_CURRENCY_CODE	DF30	2	B	Service Currency Code
TAG_RUPAY_SERVICE_FOLDER	DF32	2	B	Service Folder
TAG_RUPAY_SERVICE_RELATED_DATA	DF33	Var.0-128	B	Service Related Data
TAG_RUPAY_SERVICE_DATA_FORMAT	DF44	Var.0-256	B	Service Data Format
TAG_RUPAY_SERVICE_TERMINAL_DATA	DF45	Var.0-96	B	Service Terminal Data
TAG_RUPAY_SERVICE_CONTROL	DF52	2	B	Service Control

#### 4.7.8.2. Other Parameter

Tag Symbol	Tag	Length	Format	Description
TAG_RUPAY_CARD_CVM_LIMIT	DF34	6	N	Card CVM Limit
TAG_RUPAY_ADDITIONAL_TERMINAL_CAPABILITIES_EXTENSION	DF3A	5	B	Additional Terminal Cap. Extension
TAG_RUPAY_APPLICATION_USAGE_CONTROL_EXTENSION	DF3B	2	N	Application Usage Control Extension
TAG_RUPAY_PRMiss	DF47	16	B	PRMiss
TAG_RUPAY_PRMacq	DF48	16	B	PRMacq
TAG_RUPAY_PRMicc	DF49	8	B	PRMicc
TAG_RUPAY_PREVIOUS_PRMICC	DF4B	8	B	Previous PRMicc
TAG_RUPAY_CONTACTLESS_TRANSACTION_LIMIT	DF4C	6	N	Contactless Transaction Limit
TAG_RUPAY_TERMINAL_CVM_LIMIT	DF4D	6	N	Terminal CVM Limit
TAG_RUPAY_PRMacq_INDEX	DF4E	1	B	PRMacq Index
TAG_RUPAY_PRMacq_KCV	DF54	3	B	PRMacq KCV
TAG_RUPAY_ICC_DYNAMIC_SIGNATURE_RECORD_IDENTIFIER	DF61	2	B	ICC Dynamic Signature Record Id
TAG_RUPAY_PRMacq_LEGACY	DF808900			
TAG_RUPAY_PRMacq_KCV_LEGACY	DF808901			
TAG_PLATFORM_KERNEL_CONFIG	DF808061	2	B	Kernel Configuration Bits description: Bits8:skip TAC/IAC default Bits7:online data capture Bits6:batch data capture Bits5:force approve Bits4:force online Other bit: RFU
TAG_PLATFORM_TAC_DENIAL	DF808020	5	B	Terminal Action Code Denial
TAG_PLATFORM_TAC_DEFAULT	DF808021	5	B	Terminal Action Code Default
TAG_PLATFORM_TAC_ONLINE	DF808022	5	B	Terminal Action Code Online
TAG_PLATFORM_TRM_TARGET	DF808023	1	B	Target Percent



ET_PERCENT				
TAG_PLATFORM_TRM_MAX_TARGET_PERCENT	DF808024	1	B	Max Target Percent
TAG_PLATFORM_TRM_THRESHOLD_VALUE	DF808025	6	N	Threshold Value
TAG_PLATFORM_FORCE_ONLINE	DF808069	1	B	Force Online
TAG_PLATFORM_FORCE_APPROVE	DF808068	1	B	Force Approve
TAG_PLATFORM_SCRIPT_RESULT	DF808064	Var.1-256	B	Script Result

#### 4.7.9. Pure

#### 4.7.10. Interact

Tag List:

Tag Symbol	Tag	Length	Format	Description
TAG_PLATFORM_KERNEL_ID	DF808000	1	B	Kernel ID FD: Interac
TAG_TERMINAL_TYPE	9F35	1	B	Terminal Type
TAG_ADDITIONAL_TERMINAL_CAPABILITIES	9F40	5	B	Additional Terminal Capabilities
TAG_INTERAC_MERCHANT_TYPE_INDICATOR	9F58	1	B	Merchant Type Indicator
TAG_INTERAC_RECEIPT_LIMIT	9F5D	6	BCD	Receipt Limit
TAG_INTERAC_CONTACTLESS_FLOOR_LIMIT	9F5F	6	BCD	Contactless Limit
TAG_PLATFORM_TAC_DENIAL	DF808020	5	B	Terminal Action Code - Denial
TAG_PLATFORM_TAC_DEFAULT	DF808021	5	B	Terminal Action Code - Default
TAG_PLATFORM_TAC_ONLINE	DF808022	5	B	Terminal Action Code - Online
TAG_TERMINAL_FLOOR_LIMIT	9F1B	6	BCD	Terminal Floor Limit
TAG_PLATFORM_TRM_TARGET_PERCENT	DF808023	1	B	Target Percent

TAG_PLATFORM_TRM_MAX_TARGET_PERCENT	DF808024	1	B	Max Target Percent
TAG_PLATFORM_TRM_THRESHOLD_VALUE	DF808025	6	BCD	Threshold Value
TAG_INTERAC_TTI	9F59	1	B	TTI
TAG_INTERAC_TTT	9F5A	1	B	TTT- No Used
TAG_INTERAC_TOS	9F5E	B	2	TOS Byte 1 Bit 8: Use Other Interface if Different Currency Byte 1 Bit 7: Use Other Interface if Different Country Code Byte 1 Bit 6: Use other Interface if Domestic transaction with different Currency
TAG_INTERAC_RETRY_LIMIT	DF808800	B	1	Retry Limit

#### 4.7.11. EFTPOS

Tag List:

Tag Symbol	Tag	Length	Format	Description
TAG_PLATFORM_KERNEL_ID	DF808000	1	B	Kernel ID FA: EFTPOS
TAG_TRANSACTION_TYPE	9C	1	B	Transaction type
TAG_APPLICATION_IDENTIFIER_CARD_TERMINAL	9F06	5-16	B	AID
TAG_PLATFORM_AID_ASI	DF808060	1	B	ASI
TAG_PLATFORM_APP_PARAMETER_DATA	DF808002	Max 256.	B	Application parameter
TAG_ACQUIRER_IDENTIFIER	9F01	6	N	Acquire ID
TAG_APPLICATION_VERSION_NUMBER_TERMINAL	9F09	2	B	Application version
TAG_MERCHANT_IDENTIFIER	9F16	15	ANS	Merchant ID
TAG_MERCHANT_CATEGORY_CODE	9F15	2	N	Merchant category code
TAG_MERCHANT_NAME_AND_LOCATION	9F4E	Max 256.	ANS	Merchant name and location
TAG_TERMINAL_IDENTIFICATION	9F1C	8	AN	Terminal ID
TAG_TERMINAL_COUNTRY_CODE	9F1A	2	N	Terminal country code
TAG_TERMINAL_TYPE	9F35	1	N	Terminal Type
TAG_TERMINAL_CAPABILITIES	9F33	3	B	Terminal capabilities B1b8:Manual key entry

				B1b7:Magnetic stripe B1b6:ICC with contact Byte1 other bits: RFU  B2b8:Plain text PIN for ICC verify B2b7:Enciphered PIN for online verify B2b6:Signature B2b5:Enciphered PIN for offline verify B2B4:No CVM required Byte2 other bits: RFU  B3b8:SDA B3b8:DDA B3b8:Card capture B3b8:RFU B3b8:CDA Byte3 other bits: RFU
TAG_ADDITIONAL_TERMINAL_CAPABILITIES	9F40	5	B	Additional terminal capabilities
TAG_PLATFORM_TAC_DENIAL	DF808020	5	B	TAC Denial
TAG_PLATFORM_TAC_DEFAULT	DF808021	5	B	TAC Default
TAG_PLATFORM_TAC_ONLINE	DF808022	5	B	TAC Online
TAG_TTQ	9F66	4	B	B3b7:CDCVM
TAG_PLATFORM_READER_CONTACTLESS_TRANS_LIMIT	DF80802A	6	N	Reader Contactless transaction limit
TAG_PLATFORM_READER_CONTACTLESS_FLOOR_LIMIT	DF80802B	6	N	Reader Contactless floor limit

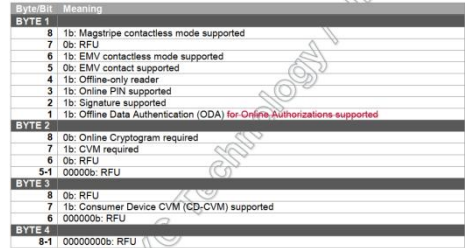
For example.

```
DF80800001FA9C01209F0606A00000038420DF8080600101DF808002819C9F01061234567890129
F090201009F160F3132333435363738393031323334359F150270329F4E175858204D45524348414
E54205959204C4F434154494F4E9F1C0846726F6E743132339F1A0203929F3501229F3303E048089
F4005FF80F0F3FFDF808020050000000000DF808021050000000000DF808022050000008000DF808
02B06000000005000DF80802A060000000100009F660400000000
```

#### 4.7.12. WISE

Tag List:

Tag Symbol	Tag	Length	Format	Description
TAG_TERMINAL_TYPE	9F35	1	N	Terminal Type
TAG_TERMINAL_CAPABILITIES	9F33	3	B	Terminal capabilities B1b8:Manual key entry

				B1b7:Magnetic stripe B1b6:ICC with contact Byte1 other bits: RFU  B2b8:Plain text PIN for ICC verify B2b7:Enciphered PIN for online verify B2b6:Signature B2b5:Enciphered PIN for offline verify B2B4:No CVM required Byte2 other bits: RFU  B3b8:SDA B3b8:DDA B3b8:Card capture B3b8:RFU B3b8:CDA Byte3 other bits: RFU
TAG_TTQ	9F66	4	B	
TAG_PLATFORM_TAC_DENIAL	DF808020	5	B	TAC Denial
TAG_PLATFORM_TAC_DEFAULT	DF808021	5	B	TAC Default
TAG_PLATFORM_TAC_ONLINE	DF808022	5	B	TAC Online
TAG_PLATFORM_READER_CONTACTLESS_TRANS_LIMIT	DF80802A	6	N	Reader Contactless transaction limit
TAG_PLATFORM_READER_CONTACTLESS_FLOOR_LIMIT	DF80802B	6	N	Reader Contactless floor limit
TAG_PLATFORM_READER_CVM_REQUIRE_LIMIT	DF808028C	6	N	Reader CVM require limit
TAG_ADDITIONAL_TERMINAL_CAPABILITIES	9F40	5	B	Additional terminal capabilities

#### 4.7.13. MIR

Tag List:

Tag Symbol	Tag	Length	Format	Description
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TAG_MIR_CDA_REUSLE	9F70	2	B	<table><tr><th colspan="10">BYTE 1</th></tr><tr><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th colspan="2">Value</th></tr><tr><td>1</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td colspan="2">ICC data missing</td></tr><tr><td>-</td><td>1</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td colspan="2">CDA failed</td></tr><tr><td>-</td><td>-</td><td>1</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td colspan="2">ICC PK certificate decoding error</td></tr><tr><td>-</td><td>-</td><td>-</td><td>1</td><td>-</td><td>-</td><td>-</td><td>-</td><td colspan="2">Issuer PK certificate revoked</td></tr><tr><td>-</td><td>-</td><td>-</td><td>-</td><td>1</td><td>-</td><td>-</td><td>-</td><td colspan="2">Issuer Identifier (BIN) is not correct</td></tr><tr><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>1</td><td>-</td><td>-</td><td colspan="2">Issuer PK certificate expired</td></tr><tr><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>1</td><td>-</td><td colspan="2">Issuer PK certificate decoding error</td></tr><tr><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>1</td><td colspan="2">CA PK not found</td></tr><tr><th colspan="10">BYTE 2</th></tr><tr><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th colspan="2">Value</th></tr><tr><td>x</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td colspan="2">SDAD missing</td></tr><tr><td>-</td><td>1</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td colspan="2">Expired Application</td></tr><tr><td>-</td><td>-</td><td>x</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td colspan="2">RFU</td></tr><tr><td>-</td><td>-</td><td>-</td><td>x</td><td>-</td><td>-</td><td>-</td><td>-</td><td colspan="2">RFU</td></tr><tr><td>-</td><td>-</td><td>-</td><td>-</td><td>x</td><td>-</td><td>-</td><td>-</td><td colspan="2">RFU</td></tr><tr><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>x</td><td>-</td><td>-</td><td colspan="2">RFU</td></tr><tr><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>x</td><td>-</td><td colspan="2">RFU</td></tr><tr><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>x</td><td colspan="2">RFU</td></tr></table>	BYTE 1										b8	b7	b6	b5	b4	b3	b2	b1	Value		1	-	-	-	-	-	-	-	ICC data missing		-	1	-	-	-	-	-	-	CDA failed		-	-	1	-	-	-	-	-	ICC PK certificate decoding error		-	-	-	1	-	-	-	-	Issuer PK certificate revoked		-	-	-	-	1	-	-	-	Issuer Identifier (BIN) is not correct		-	-	-	-	-	1	-	-	Issuer PK certificate expired		-	-	-	-	-	-	1	-	Issuer PK certificate decoding error		-	-	-	-	-	-	-	1	CA PK not found		BYTE 2										b8	b7	b6	b5	b4	b3	b2	b1	Value		x	-	-	-	-	-	-	-	SDAD missing		-	1	-	-	-	-	-	-	Expired Application		-	-	x	-	-	-	-	-	RFU		-	-	-	x	-	-	-	-	RFU		-	-	-	-	x	-	-	-	RFU		-	-	-	-	-	x	-	-	RFU		-	-	-	-	-	-	x	-	RFU		-	-	-	-	-	-	-	x	RFU																																																																																																																																																																																																									
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TAG_MIR_CARD_PROCESSING_REQUIREMENTS	9F71	2	B	<table><tr><th colspan="10">BYTE 1</th></tr><tr><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th colspan="2">Value</th></tr><tr><td>x</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td colspan="2">Online PIN (CVM)</td></tr><tr><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td colspan="2">Online PIN required</td></tr><tr><td>0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td colspan="2">Online PIN Not required</td></tr><tr><td>-</td><td>x</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td colspan="2">Signature (CVM)</td></tr><tr><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td colspan="2">Signature required</td></tr><tr><td>0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td colspan="2">Signature not required</td></tr><tr><td>-</td><td>-</td><td>x</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td colspan="2">No CVM</td></tr><tr><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td><td colspan="2">No CVM required</td></tr><tr><td></td><td></td><td>0</td><td></td><td></td><td></td><td></td><td></td><td colspan="2">No CVM not allowed</td></tr><tr><td>-</td><td>-</td><td>-</td><td>0</td><td>-</td><td>-</td><td>-</td><td>-</td><td colspan="2">RFU</td></tr><tr><td>-</td><td>-</td><td>-</td><td>-</td><td>0</td><td>-</td><td>-</td><td>-</td><td colspan="2">RFU</td></tr><tr><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>0</td><td>-</td><td>-</td><td colspan="2">RFU</td></tr><tr><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>x</td><td>-</td><td colspan="2">CD-CVM Required</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td><td></td><td colspan="2">CD-CVM Required (but was not performed)</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td>0</td><td></td><td colspan="2">CD-CVM Not required</td></tr><tr><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>x</td><td colspan="2">CD-CVM indicator</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td><td colspan="2">CD-CVM Successfully Performed</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>0</td><td colspan="2">CD-CVM was Not Performed</td></tr><tr><th colspan="10">BYTE 2</th></tr><tr><th>b8</th><th>b7</th><th>b6</th><th>b5</th><th>b4</th><th>b3</th><th>b2</th><th>b1</th><th colspan="2">Value</th></tr><tr><td>x</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td colspan="2">Switch to another interface if unable to process online</td></tr><tr><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td colspan="2">Switch to another interface if unable to process online</td></tr><tr><td>0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td colspan="2">Continue transaction processing if unable to process online (b5 analysis)</td></tr><tr><td>-</td><td>x</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td colspan="2">CDA failed processing rule</td></tr><tr><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td colspan="2">Online processing allowed if CDA failed</td></tr><tr><td>0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td colspan="2">decline if CDA failed</td></tr><tr><td>-</td><td>-</td><td>x</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td colspan="2">Delayed authorization indicator</td></tr><tr><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td><td colspan="2">Delayed authorization Not allowed</td></tr><tr><td></td><td></td><td>0</td><td></td><td></td><td></td><td></td><td></td><td colspan="2">Delayed authorization 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