Uniform Industrial Corp.®

UIC680 Contactless Smart Card Reader Module

Programmer's Manual

RS232 & USB Interface

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NOTICE

The issuer of this manual has made every effort to provide accurate information contained in this manual. The issuer shall not be held liable for any technical and editorial omissions or errors made herein; nor for incidental consequential damages resulting from the furnishing, performance or use of this material.
 The information provided in this manual is subject to change without notice.

AGENCY APPROVED

- *Specification for FCC Class B*
- Specification for CE Class B, CISPR 22 Class B

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- *Reorient or relocate the receiving antenna.*
- *Increase the separation between the equipment and receiver.*
- *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
- *Consult the dealer or an experienced radio/ TV technician for help.*

You are cautioned that any change or modifications to the equipment not expressly approve by the party responsible for compliance could void your authority to operate such equipment.

WARRANTY

This product is served under one-year warranty of defects in material and functionality to the original purchasers. Within the warranty period, if the product found to be defective will be repaired or replaced. This warranty applies to the products only under the normal use of the original purchasers, and in no circumstances covers incidental or consequential damages through consumers' misuse or modification of the product.

PREFACE

This manual provides detailed information relating to the overall operational, electrical, mechanical, environmental and functional aspects of the UIC680. This document should be read and understood prior to the initial operation of the product.
For ease of installation and programming use, we have addressed everything from its attractive features to its various configurations.
When designing the UIC680, we selected what we feel are the most useful features and functions. If in some cases you find that your specific needs differ from our existing products, we welcome your comments and suggestions. Custom-designed models are also available.
If further questions do arise, please call for technical support. Our FAE will assist you in any way we can.

1. General Description

This section presents general information about the basic characteristics of the UIC680.

1.1. Features

The UIC680 provides the following features:

1	Small footprint PCB size: 50 L* 40 W (mm) without antenna board
2	Supports ISO 14443 & ISO 18092 standard
3	Supports American Express® ExpressPay, MasterCard® PayPassTM (Contactless MagStripe and M/Chip), Visa® PayWave (MSD and qVSDC), and Discover Network Zip Contactless Payments applications, Google Wallet, ISIS Wallet.
4	Reads/Writes NXP MIFARE Plus/Classic/Ultralight/DESFire cards
5	NFC Peer-to-Peer function
6	Encrypted card data output (optional)
7	Provides options for the direct coupling antenna and the remote antenna
8	Support RS232, USB 2.0 and serial TTL (optional) interfaces by use of corresponding cables.
9	RS232-to-RS232 pass-through (optional)
10	2-SAM or 4-SAM board (optional)

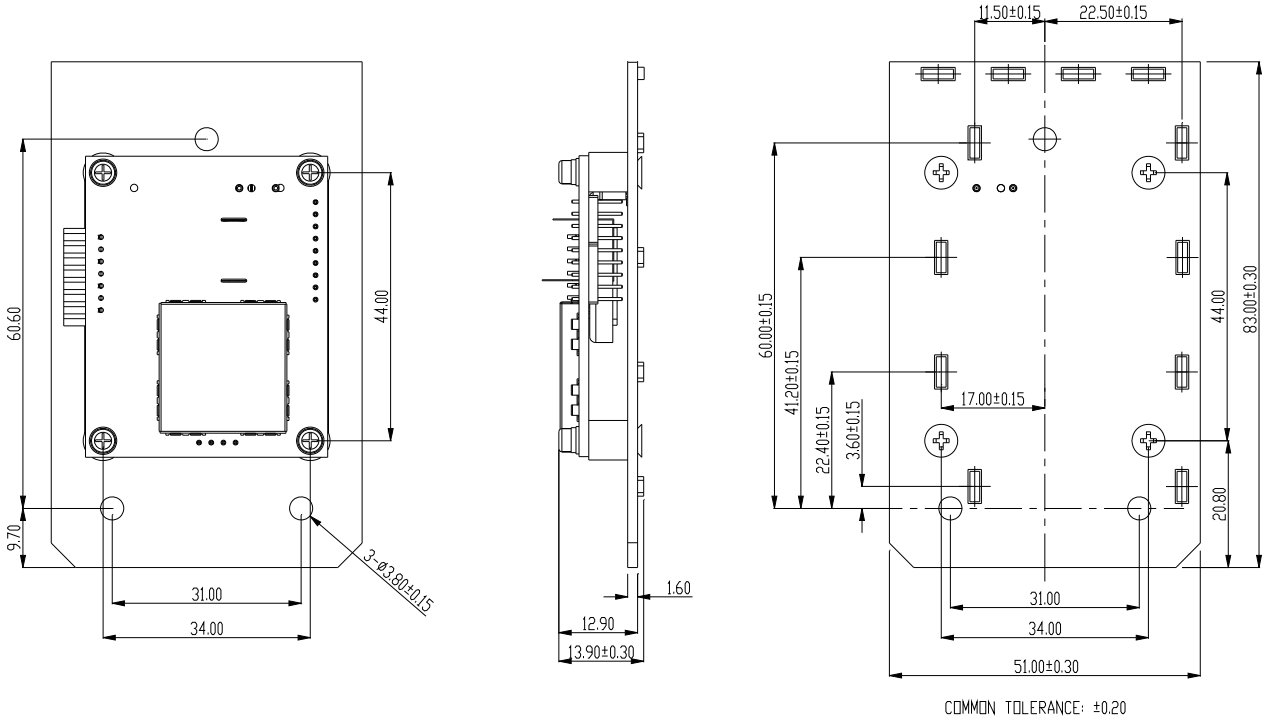
1.2. Application

The contactless smart card reader module UIC680 is mainly to support the contactless payment systems. The small footprint size of the module makes it easy to integrate to the current transaction system such as Point-of-Sale terminal, kiosk, and vending machine station. The module communicates with a host computer or terminal using a standard RS-232, USB or serial TTL (optional) interface.

2. Configurations

This section shows the dimensions and accessories of the UIC680.

2.1. Dimensions of UIC680 PCBA



3. Technical Specifications

3.1. Functional Specifications

Basic functions	Contactless communication at 13.56MHz
	4 LED indications for vertical or horizontal mount
	Programmable audio buzzer
	Real time clock /w 5 years battery life
Standards	ISO 14443 type A and B compliant
	ISO 18092 compliant
Interfaces	RS232 and USB2.0 interfaces by use of corresponding cables.
	USB 2.0 compliant interface configurable to support USB HID Keyboard, or USB Virtual COM.
	RS232 data output baud rate up to 115.2K BPS
	RS232 pass through baud rate up to 115.2K BPS (optional)
	TTL level for serial data output (optional)
Antennas	Build-in direct matching antenna
	Remote 50 ohm matching antenna (optional)
Payment applications	American Express ExpressPay
	Discover ZIP
	MasterCard PayPass/MCHIP
	Visa MSD/qVSDC
	Google wallet
	ISIS wallet

MIFARE applications	Read/Write of MIFARE Plus/Classic/Ultralight/DESFire cards Support MIFARE higher baud rate up to 424KHz
Encrypted card data output (optional)	Encrypted card data (AES or Triple DES) DUKPT key management with more than 2M keys (model selectable) Authentication with RSA 2048 bit key
Contact smart card	Supports 2-SAM or 4-SAM board (optional)

3.2. Mechanical Specifications

Dimension	Without antenna board Length: 50 mm Width: 40 mm

3.3. Electrical Specifications

Power Required	5VDC ± 5%
Power Consumption	330mA in idle mode; 430mA in operating mode
Communication	Standard RS232 signal level Compatible with USB 2.0 specification TTL 5V signal level (optional)
Communication Signal	Logic 1 = -3 volts to -15 volts or TTL level 5 volts

(RS232) Logic 0 = +3 volts to +15 volts or TTL level 0 volt

3.4. Environmental Specifications

Temperature Operating: -20 to 70℃

Storage: -30 to 70℃

Extended Temperature Operating: -25 to 80℃

Storage: -30 to 85℃

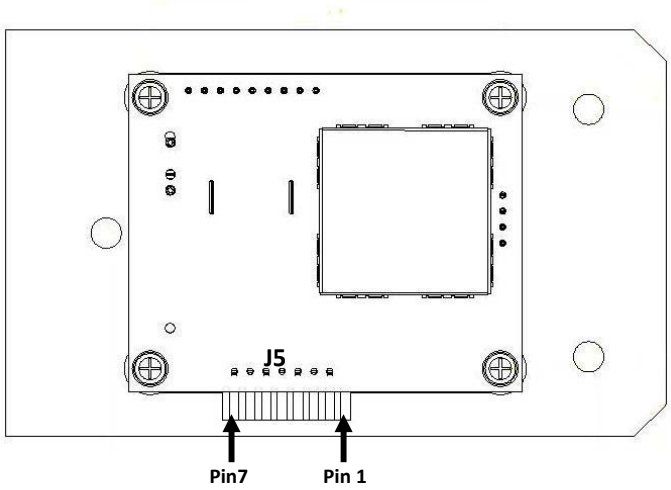
(Optional Model – Conformal Coating and No Battery.)

Humidity Operating: 10 to 85% (non condensing)

Storage: 10 to 90% (non condensing)

3.5. Pin Assignment

Interface J5 Pin Assignment



PCB-J5	Direction	Signal
1		GND
2	Serial data to host	TXD_Out
3	Serial data from host	RXD_In
4		VCC
5	USB data or Serial Pass-thru (optional)	USB D- or TXD2 (optional)
6	USB data or Serial Pass-thru (optional)	USB D+ or RXD2 (optional)
7		Shield

Direct Match Antenna Port J2A1 Pin Assignment

Contact number	Signal
1	RX
2	TX
3	GND
4	GND

3.6. Communication

RS232 Interface Data Output

Synchronization
The interface receives and transmits serial asynchronous data at voltage levels compatible with the RS232 specification.

Baud Rate
9600 BPS default (optional: 1200/2400/4800/9600/19200/38400/56000/115.2K BPS)

RS232 Interface Pass Through (Optional)

Baud Rate
9600 BPS default (optional: 1200/2400/4800/9600/19200/38400/56000/115.2K BPS)

USB Interface
Compatible with USB specification 2.0
The in/out commands will use the HidD_GetFeature/HidD_SetFeature functions of the Windows standard USB HID driver.

Identification Information
USB Vendor ID: 6352
USB Product ID: 681B (HID Keyboard) / 681C (Virtual COM) / 681D (HID-MSR)

4. Operation

After power up the device, the first right vertical LED is turned on with one beep sound indicating that the reader is ready to operate.
As factory default setting, UIC680 is set to Self-Arm mode enabled. Under this mode, the reader will read and transmit payment card[1] data automatically. User needs to disable this mode in order to send contactless card operation commands.

4.1. Reader Default Setting

Item Description	EEPROM Default Value
UART1 setting (Txd1/Rxd1)	9600-8-N-1
Data pass through mode	Disable
UART2 setting (Txd1/Rxd2)	38400-8-N-1 (optional)
USB Interface	USB HID Keyboard
Buzzer	Enable
Protocol format	Protocol 0 (USI0)
Contactless Self-Arm mode	Enable
Contactless smart card manual type (only available in host poll mode)	Type A
Optional functions for the variant versions[2]	
Google application	Mifare First
Administration command protect	Enable
Data Encryption	Enable
Crypto Algorithm	TDES
DUKPT Key Management Mode	Auto rollover 1
Pre-load encryption key	(Customer specific or UIC default)
Pre-load Google Wallet merchant keys	Yes (per merchant request)

[1] Payment card – the card with MasterCard PayPass, VISA payWave, ExpressPay, or Discover Zip application.
[2] Please contact UIC support team for more detail information.

4.2. Reader Configurations

4.2.1. Transmission Protocol

The user may select from three different protocols: Protocol 0, 1, and 2.
Upon reset, the reader will send out the default power-on character ":", or any character specified by the configuration setting.

Important:
When the UIC680 is working in the USB interface, we need to add the header byte C2h and the 2-byte data length before the command.

Protocol 0

In Protocol 0, all characters are transmitted and received using exactly the characters listed in Section 4. There are no headers and Block Check Characters (BCC). Protocol 0 presumes no transmission errors. If the host detects an error, it may request a retransmission.

Example of Protocol 0, RS232 Interface

Host Command	Reader Response	Comment
P		Ready to read
	^	Reader ACK

Example of Protocol 0, USB Interface

Host Command	Reader Response	Comment
<C2h><00h><01h>P		Ready to read
	<C2h><00h><01h>^	Reader ACK

Protocol 1

In Protocol 1, all messages are preceded by the ASCII character <STX> and terminated with the ASCII character <ETX>, followed by a one byte <BCC>.
<BCC> is an XOR of the 7 data bits, excluding parity, of each character in the entire message, including <STX>.

Format: <STX><MESSAGE><ETX><BCC>

Where STX=02Hex and ETX=03Hex.

Example of Protocol 1, RS232 Interface

Host Command	Reader Response	Comment
<02h>P<03h><51h>		Ready to read
	<02h>^<03h><5Fh>	Reader ACK

Example of Protocol 1, USB Interface

Host Command	Reader Response	Comment
<C2h><00h><04h><02h>P<03h><51h>		Ready to read
	<C2h><00h><04h><02h>^<03h><5Fh>	Reader ACK

Protocol 2

In Protocol 2, all messages are preceded by the ASCII character <SOH>, followed by a one byte reader address, two bytes the length of message (first byte is high byte, second byte is low byte) and terminated with a one byte <BCC>.
The <BCC> is an XOR of the characters (8 bits) in the entire message, including <SOH>.

Level2 Protocol, RS232 Interface

SOH, 1 byte	Address, 1 byte	The length of message, 2 byte	Message, Var bytes	BCC, 1 byte

Example of Protocol 2, RS232 Interface

Host Command	Reader Response	Comment
<01><00><00><01>P<50h>		Ready to read
	<01><00><00><01>^<5Eh>	Reader ACK

Level2 Protocol, USB Interface, adding the header <C2h><Len 1><Len 2><Level 2 Protocol>

C2h, 1 byte	Length, 2 bytes	SOH, 1 byte	Address, 1 byte	The length of message, 2 byte	Message, var bytes	BCC, 1 byte

Example of Protocol 2, USB Interface

Host Command	Reader Response	Comment
<C2><00><06><01><00><00><01>P<50h>		Ready to read
	<C2><00><06><01><00><00><01>^<5Eh>	Reader ACK

The <ADDRESS> field is for a multi-reader system. This function is not currently supported. The

recommended value for this field is NULL (00Hex) but any value will work.

For Protocols 1 and 2, if the reader detects an error in an incoming transmission, it will respond with a “Communications Error” message. If the host detects a transmission error, it may request a retransmission.

Protocol 0 is the simplest protocol without adding the redundant data. In order to handle the properly communication, it enforces a 100mSec timeout between characters. In brief, the reader expects the incoming command is ready after 100 ms timeout. For the applications with the short latency requirement, please choose Protocol 1 or 2. The reader processes the incoming command right after received a complete packet. If the application requests to exchange the binary data, Protocol 2 is recommended.

4.2.2. BLP Protocol

The user can use the configuration commands to configure the UIC680 purposely to access EMV card and configure the EEPROM setting by **BLP** protocol. Since the configuration commands setting in the EEPROM will not disappear while re- power on.

BLP Format
Send Command: PC → Reader

BLP Protocol – RS232 Interface

09h	Command Len, 2 bytes	Command/Data	BCC, 1 byte

EXAMPLE:

<09h><00h><00h><3 BYTE COMMAND><BCC> is default command format

BLP Protocol - USB Interface (adding the header C2h and Total Data Len)

C2h	Total Data Len, 2 bytes	09h	Command Len, 2 bytes	Command/Data	BCC, 1 byte

EXAMPLE:

<C2h><00h><07h><09h><00h><00h><45h><53h><44h><5Bh>

Total Data Len = <09h> + <Command Len> + <Command/Data> + <BCC>

Command Len give the length of the command (first byte is high byte, second byte is low byte). If Command Len is 00h that indicates the command is 3 bytes

BCC = <09h> ⊕ <Command Len> ⊕ ….<Command N>, BCC is the calculated the first byte to the last byte before BCC.

Note:

If Command Len is 00h or 03h, it indicates that 3-byte commands come next.

If Command Len is 02h, it indicates that 2-byte commands come next.

In BLP protocol, if the third command byte is <00h>, you can send only 2 bytes command (Command Len = 02h) and ignore the third command byte.

Response: Reader → PC

Protocol of RS232 interface

^ (5Eh) – ACK: Acknowledges correct completion of most recent command.

! (21h) – Invalid Command: Command was received correctly, but is not a recognized.

DATA: No wrapped data.

Protocol of USB HID interface

<C2h><00h><01h><5Eh> – ACK: Acknowledges correct completion of most recent command.

<C2h><00h><01h><21h> – Invalid Command: Command was received correctly, but is not a recognized.

<C2h><Total Data Len>DATA: No wrapped data.

4.2.3. Self – Arm Mode

The default reader configuration is in "Self-Arm Mode". This allows the payment cards (including PayPass Magnetic Stripe, VISA MSD, ExpressPay card and the general magnetic stripe credit cards) reading functions to run automatically, reporting the card data to the host without any instruction sent from the host.

With the reader running In the Self-Arm Mode, it can be configured to the "Host Polled Mode" by disabling the Self-Arm Mode. The "Host Polled Mode" allows the card reading functions to be controlled by the relevant host commands.

Card Data Output for Different Types of Card and Reader Configurations

With the reader running in the Self-Arm mode, depending on the configuration set in the reader and the type of card to be read, the reader will output different types of card information. The following table lists out the summary of it:

Type of Card	Reader Configuration	
	Mifare Card Support	
	Disabled (MFxy = 10)[3]	Enabled (MFxy = 11)
Payment Card	Track data	Track data
Mifare Standard 1K	N/A	"M2"
Mifare Standard 4K	N/A	"M3"
Mifare Ultralight	N/A	"M1"
Mifare Ultralight C	N/A	"M1"
Mifare DESFire	N/A	"M4"
Mifare Plus	N/A	"M5"

Card Data Output in Self-Arm and Host-Polled modes

Sending card data under the Self-Arm mode:
Under the Self-Arm mode, the card data output will not include the protocol envelope code. The user can insert the envelope code by utilizing the configuration commands—**SE** and **TO**[4].

[3] Please refer to UIC680 Configuration Guide for the detail information.
[4] Please refer to UIC680 Configuration Guide for the detail information.

Card data output clear format (Self-Arm mode)

Preamble	Protocol Envelope code	Tk1 prefix	Tk1 Data	Tk1 suffix	
	Separator	Tk2 prefix	Tk2 Data	Tk2 suffix	
	Separator	Tk3 prefix	Tk3 Data	Tk3 suffix	
	Separator	Tk4 Data		Protocol Envelope code	Postamble

The preamble/postamble is only available in the card data output format under Self-Arm mode. The UIC680 can be configured to become a secure reader which will output encrypted card data. The data format is as follows:

Encrypted Card data output format (Self-Arm mode)

DUKPT data output format

Encrypt Mode	|	Encrypted Tk1 Data	|	Encrypted Tk2 Data	|	Encrypted Tk3 Data	|	Encrypted Tk4 Data	|	DUKPT KSN	|	Encrypted Session ID	|

RSA data output format

Encrypt Mode	|	Encrypted Tk1 Data	|	Encrypted Tk2 Data	|	Encrypted Tk3 Data	|	Encrypted Tk4 Data	|

Notes Encrypt Mode – 1: DUKPT TDES Mode
2: DUKPT AES Mode
3: RSA Mode

4.2.4. Host Poll Mode

Under this mode, user can send out commands manually. Examples like the Q, R, S, U commands for individual track card data; the commands for controlling the LED and commands for turn on/off antenna power. Host Poll mode is disabled if the reader is configured with default setting.

Read card data using commands in the Host-Polled mode

The reader replies to the so called “Host-Polled” command such as “Transmit Track Data”. The requested message is encapsulated in the protocol envelope.

The response of the Transmit Track Data command is listed as below:

Read TK1 data for command

Protocol Envelope code	Tk1 prefix	Tk1* Data	Tk1 suffix	Protocol Envelope code

Read TK2 data for command

Protocol Envelope code	Tk2 prefix	Tk2* Data	Tk2 suffix	Protocol Envelope code

Read TK3 data for command

Protocol Envelope code	Tk3 prefix	Tk3* Data	Tk3 suffix	Protocol Envelope code

Read TK4 data (optional) for command

Protocol Envelope code	Tk4* Data	Protocol Envelope code

TK* Track Data Included:

SS (Optional)	Track Data	ES (Optional)	LRC (Optional)

The Protocol Envelope code can be <HEADERS>, <BCC> or NONE, it is depended on which protocol is being used.

4.2.5. Details of the Payment Card Tracks Data

The UIC680 reader running at Self-Arm mode will automatically decode the payment card data according to the payment application type. For non-supported payment cards, it is possible to go through the host-polled mode to query the card data.

In general, for the supported payment cards, track 1 and 2 card data will always be present for a successful reading. Some transactions may request extra information outside track 1 & track 2. The UIC680 has introduced a way to reduce the communication time between the host and the reader where the particular information can be stored in track 3 or even track 4. This depends on the card type and its application is described in the following sections.

Track 3 Data Format

The track 3 data of the contactless card is mainly provided for the additional information required by the payment transactions. It is currently available for the Paypass-Mchip and Visa cards (qVSDC, MSD) and not for other contactless payment cards. Track 3 data is the necessary additional information to be used for System Integration.

To simplify the host application process, this data only contains the value field of the Tag Length Value (TLV) data objects and is expressed in Hex format. The data objects placement is arranged in fixed sequence and are separated by the field separator '='. The transaction data object field is empty if the data object is absent in the card. Moreover, the track 3 data begins with start sentinel and ends with end sentinel.

Track 3 Data Format

Start sentinel	Card Type	Transaction Result	Transaction Data Object(s) (card type dependent)	End sentinel
1-byte	1-byte	2-byte	Each object is separated by the field separator.(n Bytes)	1-byte

Table of Tag Length Value and Its Description

Tag	Description	Card Type*	Data Object Format in Payment Specification Type, Data Length (byte)	Track 3 (ASCII-HEX) , RS232/Vcom Interface Data Length (byte)
+	Start Sentinel			
x	Card Type			
xx	Transaction Result			
=	Field Separator			
50	Application Label	MasterCard	ans, up to 16 bytes	Up to 16 bytes
57	Track 2 Equivalent Data	V/M	Binary, 1~19 var.	2~38 bytes

Tag	Description	Card Type*	Data Object Format in Payment Specification Type, Data Length (byte)	Track 3 (ASCII-HEX) , RS232/Vcom Interface Data Length (byte)
5A	PAN	V/M	cn, 0~19 var, up to 10 byte.	0~20 bytes
5F20	Cardholder Name	VISA	ans 2~26, 2~26 bytes	2~26 bytes
5F24	Expiry Date	V/M	n 6 (YYMMDD), 3 bytes	6 bytes
5F2A	Transaction Currency Code	V/M	Binary, 2 bytes	4 bytes
5F34	Application PAN Sequence Number	V/M	n 2, 1 byte	2 bytes
82	Application Interchange Profile	V/M	Binary, 2 bytes	4 bytes
84	Dedicated File Name	MasterCard	Binary, 5~16 var.	10~32 var
95	Terminal Verification Results	V/M	Binary, 5 bytes	10 bytes
9A	Transaction Date	V/M	n 6 (YYMMDD), 3 bytes	6 bytes
9B	Transaction Status Information	V/M	Binary, 2 bytes	4 bytes
9C	Transaction Type	V/M	n 2, 1 byte	2 bytes
9F02	Amount, Authorized (Numeric)	V/M	n 12, 6 bytes	12 bytes
9F03	Amount, Other (Numeric)	V/M	n 12, 6 bytes	12 bytes
9F09	Terminal Application Version Number	V/M	Binary, 2 bytes	4 bytes
9F10	Issuer Application Data	V/M	Binary, var. up to 32 bytes	var. up to 64 bytes
9F11	Issuer Code Table Index	MasterCard	n 2, 1 bytes	4 bytes
9F12	Application Preferred Name	MasterCard	ans, up to 16 bytes	Up to 16 bytes
9F16	Merchant ID	V/M	ans, 15 bytes	30 bytes
9F17	Personal Identification Number (PIN) Try Counter	VISA	Binary, 1 byte	2 bytes
9F1A	Terminal Country Code	V/M	Binary, 2 bytes	4 bytes
9F1E	Interface Device Serial Number (IFD)	V/M	an, 8 bytes	16 bytes
9F26	Application Cryptogram	V/M	Binary, 8 byte	16 bytes
9F27	Cryptogram Information Data	MasterCard	Binary, 1 byte	2 bytes
9F33	Terminal Capabilities	V/M	Binary, 3 bytes	6 bytes
9F34	Cardholder Verification Method Results	MasterCard	Binary, 3 bytes	6 bytes
9F35	Terminal Type	V/M	n 2, 1 byte	2 bytes

Tag	Description	Card Type*	Data Object Format in Payment Specification Type, Data Length (byte)	Track 3 (ASCII-HEX) , RS232/Vcom Interface Data Length (byte)
9F36	Application Transaction Counter	V/M	Binary, 2 bytes	4 bytes
9F37	Unpredictable Number	V/M	Binary, 4 bytes	8 bytes
9F40	Additional Terminal Capabilities	V/M	Binary, 5 bytes	10 bytes
9F41	Transaction Sequence Counter	MasterCard	n 4~8 var., 2~4 bytes	4~8 bytes
9F51	Application Currency Code	VISA	n 3, 2 bytes	4 bytes
9F53	Transaction Category Code	MasterCard	Binary, 1 byte	2 bytes
9F54	Cumulative Total Transaction Amount Limit	VISA	n 12, 6 bytes	12 bytes
9F5D	Available Offline Spending Amount	VISA	n 12, 6 bytes	12 bytes
9F66	Terminal Transaction Qualifiers	VISA	Binary, 4 bytes	8 bytes
9F68	Card Additional Processes	VISA	Binary, 4 bytes	8 bytes
9F6B	Card CVM Limit	VISA	n 12, 6 bytes	12 bytes
9F6C	Card Transaction Qualifiers	VISA	Binary, 2 bytes	4 bytes
9F6D	VLP Reset Threshold	VISA	n 12, 6 bytes	12 bytes
9F6E	Form Factor Indicator	VISA	Binary, 4 bytes	8 bytes
9F6E	Third Party Data	MasterCard	Binary, 5-32 var.	10~64 bytes
9F78	VLP Single Transaction Limit	VISA	n 12, 6 bytes	12 bytes
9F79	VLP Available Funds	VISA	n 12, 6 bytes	12 bytes
9F7C	Customer Exclusive Data	VISA	Binary, 0~32 var.	0~64 bytes
-	POS Entry Mode	VISA	Binary, 1 byte, VISA only, the value of '91' for MSD transactions. The value of '07' for qVSDC transactions	2 bytes
-	Terminal Entry Capability	VISA	"5" (for readers that also support VSDC contact chip) or "8" (for readers that do not also support VSDC contact chip).	1 byte
?	End Sentinel			

TLV (Tag Length Value) Description

[Tag] means the Tag of TLV. If the TLV is present in the transaction, it will show in Track 3, else the [Tag] will leave it nothing. If Value of TLV is not alphanumeric or numeric, the data will show in Hex Format.
Ex: 2AH will show 2A in ASCII code to be visible.

Data objects moved from the card to the reader are encapsulated in TLV encoded data objects. Data objects that have the numeric (n) format are BCD encoded, right justified with leading hexadecimal zeros. Data objects that have the compressed numeric (cn) format are BCD encoded, left justified and padded with trailing 'F's.
Note that the length indicator in the numeric and compressed numeric format notations (e.g. n 4) specifies the number of digits and not the number of bytes.
Data objects that have the alphanumeric (an) or alphanumeric special (ans) format are ASCII encoded, left justified and padded with trailing hexadecimal zeros.

***Value of Card Type**

Card Type: It indicates the tag may appear in track 3 by reading the particular card. V/M means VISA and MasterCard. If the card brand doesn't show in the card type field, It doesn't imply its card doesn't support such tag.

Value	Card Type*
0	MChip
1	MagStripe V3.3
2	Amex EMV (Reserve)
3	Visa(qVSDC, MSD)
4	Interac (Reserve, not available)
5	Discover D-PAS (Reserve)

****Value of Transaction Result**

Value	Transaction Result**
00	Offline Approved
01	Offline Declined
02	Online
03	Switch to other interface
99	Terminate

4.2.6. Payment Card Data Output Example

PayPass–Magstripe3.3

Track 3 data format:

+	Card Type (1-byte)	Transaction Result (2-byte)	[DD_{Card} Track1]=[DD_{Card} Track2]= [9F6E]=[84]=[50] =[9F12]=[9F11]	?

Track Data:

%B5413330056003529^CUST IMP MC 352/^1412205990090990000009990990969929990400?;5413330056003529=14122059999999469960?+102=990090990000009990990969929990400=9999999469960==A0000000041010=ID352 v1 1===?

Parsed Track Data:

Track 1	%B5413330056003529^CUST IMP MC 352/^1412205990090990000009990990969929990400?
Track 2	;5413330056003529=14122059999999469960?
Track 3	+102=990090990000009990990969929990400=9999999469960==A0000000041010=ID352 v1 1===?

Parsed Track 3 Data:

Card Type	Result
1	02
Magstripe	Online Request

Position	1	2	3
Tag	DD_{Card} Track1	DD_{Card} Track2	9F6E
Value	990090990000009990990969929990400	9999999469960	
Description			PayPass Third Party Data

Position	4	5	6	7	8
Tag	84	50	9F12	9F11	5F2D
Value	A0000000041010	ID352 v1 1			
Description	DF Name	Application Label	Application Preferred Name	Issuer Code Table Index	Language Preference

Paypass–Mchip

Track 3 data format:

+	Card Type (1-byte)	Transaction Result (2-byte)	=[CVM]=[9F26]=[9F10]=[9F37]=[9F36]=[95]=[9B]=[9A]=[9C]=[9F02]=[5F2A] =[82]=[9F1A]=[9F03]=[9F33]=[9F35]=[84]=[9F09]=[9F1E]=[9F16]=[9F41]=[9F27] =[9F34]=[9F53]=[5A]=[5F24]=[57]=[9F6E]=[50]=[9F12]=[9F11]=[5F34]	?

Track Data:

%B5413330089600119^0056^ETEC/PAYPASS^141231^^?;5413330089600119=1412==?+002=1F=96EB58603A581C2F=0110A0000000000000000000000000000FF0000000000000000000000000000=14A946B2=0001=8000000000==120604=00=000000001500=0978=1880=0056=000000000000=000888=22=A0000000041010=0002=1234567890000000=303030303030303030303030303031=00000039=80=1F0300=00=5413330089600119=141231=5413330089600119D14122010123409172==505043204D434420313120763220 31===01?

Parsed Track Data:

Track 1	%B5413330089600119^0056^ETEC/PAYPASS^141231^^?
Track 2	;5413330089600119=1412==?
Track 3	+002=1F=96EB58603A581C2F=0110A0000000000000000000000000000FF0000000000000000000000000000=14A946B2=0001=8000000000==120604=00=000000001500=0978=1880=0056=000000000000=000888=22=A0000000041010=0002=1234567890000000=303030303030303030303030303031=00000039=80=1F0300=00=5413330089600119=141231=5413330089600119D14122010123409172==505043204D434420313120763220 31===01?

Parsed Track 3 Data:

Card Type	Result
0	02
M-Chip	Online Request

Position	1	2	3	4
Tag	CVM	9F26	9F10	9F37
Value	1F	96EB58603A581C2F	0110A0000000000000000000000000000000FF0000000000000000000000000000	14A946B2
Description	No CVM	Application Cryptogram	Issuer Application Data	Unpredictable Number

Position	5	6	7	8
Tag	9F36	95	9B	9A
Value	0001	8000000000		120604
Description	Application Transaction Counter	Terminal Verification Results	Transaction Status Information	Transaction Date

Position	9	10	11	12
Tag	9C	9F02	5F2A	82
Value	00	000000001500	0978	1880
Description	Transaction Type	Amount, Authorized	Transaction Currency Code	Application Interchange

				Profile

Position	13	14	15	16
Tag	9F1A	9F03	9F33	9F35
Value	0056	000000000000	000888	22
Description	Terminal Country Code	Amount, Other	Terminal Capabilities	Terminal Type

Position	17	18	19	20
Tag	84	9F09	9F1E	9F16
Value	A0000000041010	0002	1234567890000000	303030303030303030303030303031
Description	DF Name	Terminal Application Version Number	Interface Device Serial Number	Merchant ID

Position	21	22	23	24
Tag	9F41	9F27	9F34	9F53
Value	00000039	80	1F0300	00
Description	Transaction Sequence Counter	Cryptogram Information Data	Cardholder Verification Method Results	Transaction Category Code

Position	25	26	27	28
Tag	5A	5F24	57	9F6E
Value	5413330089600119	141231	5413330089600119D14122010123409172	
Description	PAN	Expiry Date	Track 2 equivalent Data	Paypass Third Party Data

Position	29	30	31	32
Tag	50	9F12	9F11	5F34
Value	505043204D43442031312076322031			01
Description	Application Label	Application Preferred Name	Issuer Code Table Index	Card Serial Number

Visa (qVSDC, MSD)

Track 3 data format:

+	Card Type (1-byte)	Transaction Result (2-byte)	=[9F26]=[9F10]=[9F37]=[9F36]=[9F66]=[95]=[9B]=[9A]=[9F02]=[5F2A]=[82] =[9F1A]=[9F03]=[9F33]=[9F35]=[9F09]=[9F1E]=[9F16]=[5F34]=[9F40]=[9F6E] =[9F7C]=[57]=[5A]=[5F20]=[5F24]=[9C]=[9F5D]=[9F68]=[9F6C]=[9F6B]=[9F51] =[9F17]=[9F78]=[9F79]=[9F6D]=[9F54]=[POS Entry Mode]=[Terminal Enter Capability]	?

Track Data:

%B4761739001010010^
/^2012120001231003990300000?;4761739001010010=2012120001233990003 1?+300=AABBCCDDEEFF1122=06011103900000=94018C92=0003=A0804000=0000000000==120604=000000000100=0840=2000=0840=000000000000=000888=22=0000=1234567890000000=303030303030303030303030303031=01=6000000001===4761739001010010D2012120001233990003 1F=4761739001010010==201231=00=000000010000==3000========07=08=40?

Parsed Track Data:

Track 1	%B4761739001010010^ /^2012120001231003990300000?
Track 2	;4761739001010010=20121200012339900031?
Track 3	+302=AABBCCDDEEFF1122=06011103900000=94018C92=0003=A0804000=0000000000==120604=000000000100=0840=2000=0840=000000000000=000888=22=0000=1234567890000000=303030303030303030303030303031=01=6000000001===4761739001010010D2012120001233990003 1F=4761739001010010==201231=00=000000010000==3000========07=08?

Parsed Track 3 Data:

Card Type	Result
3	02
VISA	Online Request

Position	1	2	3	4
Tag	9F26	9F10	9F37	9F36
Value	AABBCCDDEEFF1122	06011103900000	94018C92	0003
Description	Application Cryptogram	Issuer Application Data	Unpredictable Number	Application Transaction Counter

Position	5	6	7	8
Tag	9F66	95	9B	9A
Value	A0804000	0000000000		120604
Description	Terminal Transaction Qualifiers	Terminal Verification Results	Transaction Status Information	Transaction Date

Position	9	10	11	12
Tag	9F02	5F2A	82	9F1A
Value	000000000100	0840	2000	0840
Description	Amount, Authorized	Transaction Currency Code	Application Interchange Profile	Terminal Country Code

Position	13	14	15	16
Tag	9F03	9F33	9F35	9F09
Value	000000000000	000888	22	0000
Description	Amount, Other	Terminal Capabilities	Terminal Type	Application Version Number

Position	17	18	19	20
Tag	9F1E	9F16	5F34	9F40
Value	1234567890000000	30303030303030303030 3030303031	01	6000000001
Description	Interface Device Serial Number	Merchant ID	Application PAN Sequence Number	Additional Terminal Capabilities

Position	21	22	23	24
Tag	9F6E	9F7C	57	5A
Value			4761739001010010D201 21200012339900031F	4761739001010010
Description	Form Factor Indicator	Customer Exclusive Data	Track 2 Equivalent Data	PAN

Position	25	26	27	28
Tag	5F20	5F24	9C	9F5D
Value		201231	00	000000010000
Description	Cardholder Name	Expiry Date	Transaction Type	Available Offline Spending Amount

Position	29	30	31	32
Tag	9F68	9F6C	9F6B	9F51
Value		3000		
Description	Card Additional Processes	Card Transaction Qualifiers	Card CVM Limit	Application Currency Code

Position	33	34	35	36
Tag	9F17	9F78	9F79	9F6D
Value				
Description	PIN Try Counter	VLP Single Transaction Limit	VLP Available Funds	VLP Reset Threshold

Position	37	38	39
Tag	9F54	POS Entry Mode	Terminal Enter Capability
Value		07	08
Description	Cumulative Total Transaction Amount Limit	qVSDC transaction	Always set to 8

Track 4 Data Format

The track 4 data of the contactless card is for the additional data or other payment card scheme.

5. Commands and Responses

5.1. Common Command Description

Reader Response Code

Response	Meaning
^	Acknowledgement
*	Cannot execute (e.g. out of range)
!	Bad parameter (e.g. incorrect length)
+ (2BH)	No Magnetic Stripe Card Data. Command was received correctly.
? (3FH)	Communication Error. Command was not received correctly.
: (3AH)	Power On report.
~ (7EH)	Unavailable. Hardware is not available to complete this request.

5.1.1. % (25H) - Retransmit

Retransmits the last message sent by the reader.
Example:

Host Command	Reader Response Example
%	
	^

Note: This command is ignored if the reader is running in Self-Arm mode.

5.1.2. 70 (37H30H) or 90(39H30H) - Serial Number Report

Gets the reader's serial number that has been stored in the EEPROM.
Example:

Host Command	Reader Response Example
70	
	00000000

5.1.3. 71 (37H31H) or 91 (39H31H) - Copyright Report

Transmits version and copyright information.
Example:

Host Command	Reader Response Example
71	

	121106,UIC 68TP961P:V1.P

This command is sent if the user wants to know the version, model and copyright of the currently loaded UIC680 firmware. The response is an ASCII string giving the firmware date (yymmdd), reader type and the firmware version number, followed by the firmware copyright statement. The firmware copyright statement is absent in OEM version.

5.1.4. 7A (37H41H) or 9A (39H41H) - Module Version Report

Transmits version information.

Send this command when users want to know the version of the module in UIC680 firmware currently loaded. The response is a 6-byte ASCII string, reader type and the module version number.

Command Pocket

Byte 0-1	Byte 2
7A (37H41H) or 9A (39H41H)	0-7 (SeeTable 5-1)

Description table

Module	In byte	Example
HAL_VERSION	0	68TH11
PAYPASS_VERSION	1	68TP11
AMEX_VERSION	2	68TA11
VISA_VERSION	3	68TV11
DN_VERSION	4	68TD11
L1_VERSION	5	68T111
L2_VERSION	6	68T211
MIFARE_VERSION	7	68TM11
NFC_VERSION	8	68TN11
GOOGLE WALLET_VERSION	9	68TG11
ISIS_VERSION	A	68TI11

Table 5-1

Example:

Host Command	Reader Response Example
7A0	
	68TH11

5.1.5. ? (3FH) - Select Verbose Responses Command

Most error responses, until the reader receives a reset command, error response will include a short descriptive message.

Example:

Host Command	Reader Response Example
?	
	^Verbose responses enabled

5.1.6. $ (24H) – Reader Status Request

Interrogate the reader about its operational status. Two bytes of status information will be returned.

Example:

Host Command	Reader Response Example
$	
	`<01>

Reader Response Example = '<01>

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 1	0	1	1	0	0	0	0	0
Byte 2	0	0	0	0	0	0	0	1

First Status Byte

Bit	Value: 0	Value: 1
0	RFU	RFU
1	No Card Present	Card Seated
2	RFU	RFU
3	RFU	RFU
4	No Card status Report	Auto Card status Report
5	always '1'	always '1'
6	Not armed to read	Armed to read
7	RFU	RFU

Second Status Byte

Bit	Value: 0	Value: 1
0	First LED OFF	First LED ON
1	LED not Flash	LED Flash
2-3	RFU	RFU
4	No RFID Read	RFID Read
5-7	RFU	RFU
Exception: If there is any LED flashes, the bit 0 status will be ignored. (i.e., in this case, bit 0 always = '0')		

5.1.7. # (23H) – Configuration Request

Returns single byte or extended 16-byte string representing the configuration of the device.
Example:

Host Command	Reader Response Example
#	
	? See Table 5-2

Reader Response Example = " ? "

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 1	0	0	1	1	1	1	1	1

Standard One Configuration Byte

Bit	Value: 0	Value: 1
0	Track 1 not present	Track 1 present
1	Track 2 not present	Track 2 present
2	Track 3 not present	Track 3 present
3-7	RFU	RFU

Table 5-2

Extended Configuration Bytes (16 bytes)

Byte	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5-15
Remark	Equip.0	Equip.1	Protocol	Speed	Address	RFU

Equip. 0 — Extended Configuration Byte 0

Bit	Value: 0	Value: 1
0-3	RFU	RFU
4	Track 1 not present	Track 1 present
5	Track 2 not present	Track 2 present
6	Track 3 not present	Track 3 present
7	RFU	RFU

Equip. 1 — Extended Configuration Byte 1

Bit	Value: 0	Value: 1
0-7	Not Used	Not Used

Byte 2 – Byte 4

Byte	Remark	
2	Protocol	00H = USI2; 03H = USI0; 06H = USI1

3	Speed	00H=1200, 01H=2400, 02H=4800, 03H=9600, 04H=19.2k, 05H=38.4k, 06H=56k, 07H=115.2k bps
4	Address	Always 00H.

By using the configuration setting command, users can select standard or extended format. Extend command usage refer to UIC680 Configuration Guide.

5.1.8. <CAN> (18H) – Clear Data Buffer

Clears read data buffers.
Example:

Host Command	Reader Response Example
<18>	
	^

5.1.9. <DC2> (12H) – RS232 pass through enable (optional)

Enable RS232 data Pass through (PT) function temporarily.
The command characters are followed by an ASCII 'P' to enable the RS232 pass through function. It is only valid in RS232 model.
Example:

Host Command	Reader Response Example
<12>P	
	^

Note: Once the pass through mode is enabled, UIC680 passes all data between COM1 and COM2 and do nothing. Power cycling (if the default of PT is disable) or send the string '<DC2>P<DC2>a<DC2>s<DC2>S' brings UIC680 back to normal operation. Before sending this command, user must assure the PT function is desired.

5.1.10. <7FH> – Warm Reset

It aborts all current actions and causes the device to execute all initialization functions. The device will respond as if in a "power up" cycle; by default it returns a ':' (3AH). This operation will take at least 3 seconds to complete.
Example:

Host Command	Reader Response Example

<7F>	
	^

5.1.11. 5 (35H) – Set RTC Time

This command is used to set and read device's RTC Time.

Command Pocket

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6
5	CMD	Date or Time				

CMD Description

[CMD, 1 byte] (ASCII – Hex value)	Description
1 (or 31h)	Read Date
2 (or 32h)	Read Time
3 (or 33h)	RFU
4 (or 34h)	Set Date
5 (or 35h)	Set Time

51 (35H31H) - Read Date

Response data Pocket:

Byte 0 – Byte 1	Byte 2	Byte 3	Byte 4
Year	Month	Date	Week
<20*><12>	<12>	<06>	<04>
*The year <20> can be interpreted as space character.			01h=Monday, 02h=Tuesday, … 07h=Sunday

Note: BCD format from 010 (0000BCD = 0h) to 910 (1001BCD = 9h)

Example:

Host Command	Reader Response Example
51	
	<20*><12><12><06><04>

52 (35H32H) - Read Time

Response data Pocket:

Byte 0 – Byte 1	Byte 2	Byte 3	Byte 4
Hour	Min	Second	Millisecond
<16>	<30>	<00>	<04><90>

Note: BCD format from 010 (0000BCD = 0h) to 910 (1001BCD = 9h)

Example:

Host Command	Reader Response Example
52	
	<16>0<00><04><90>

54 (35H34H) - Set Date

Command Pocket:

Byte 0-1	Byte 2-3	Byte 4	Byte 5	Byte 6
Command	Year	Month	Date	Week
54	<14><0C>	<0C>	<06>	<04>
Hex value format valid input				01h=Monday, 02h=Tuesday, … 07h=Sunday
Default setting is <20><01><01><01><01>, obtained by Read Date. YYYY: 14h 00h – 1Eh FFh (2000 – 3000) If the 'YYYY' falls out of range, the reader will restore the configuration to default settings after resetting the device.				

Example:

Host Command	Reader Response Example
54<14><0C><0C><06><04>	
	^

55 (35H35H) - Set Time

Command Pocket: (Hex value format valid input)

Byte 0-1	Byte 2	Byte 3	Byte 4	Byte 5-6
Command	Hour	Min	Second	Millisecond
55	<11>	<0E>	<37>	<00><0A>

Example:

Host Command	Reader Response Example
55<11><0E><37><00><0A>	
	^

5.1.12. B (42H) – Buzzer Beep control

Used to let Buzzer beep under user's control.

Command Pocket

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4
Command	Count	Tone	On Duration	Short Duration
B	<31>	<30>	<7F>	<00>

Example:

Host Command	Reader Response Example

B<31><30><7F><00>	
	^

Command Type

Field	Description
Count	0 (30h, ASCII Hex) – long beep **Important: Once 'B0' command starts beeping, NO command can STOP it–unless users send a "Reset" command to stop it.
	1~9, A~F(31h~39h 41h~46h, ASCII Hex) – 1~15 short beeps
Tone	For adjusting the frequency level, 00h~FFh(high → low).
On Duration	The duration of a beep; time unit is 10ms, 00h means 10ms, FFh means 2560ms.
Short Duration	The interval between 2 beeps in unit of 10 milliseconds; 00h means 10ms, FFh means 2560ms.

Note: If Type parameter is omitted, reader will treat it as the ONE SHORT Beep command.

5.1.13. I (49H) – Load RSA Key

This command is used to load RSA Key and query Key Index for PayPass MCHIP and VISA qVSDC applications.

Example:

Host Command	Reader Response Example
I1<01><00><A2><05><00><00><00><00><01><01><03><03><01><00><01><80><14><C3><12><D4><88><A7><09><88><A4><F2><19><D5><D6>~y<8F><DC><A0><A7><0D><90>fc<13>:p<98><1E>a&<F9>+(<8B><ED><98><D6><97><82><CC><A8><C5><94><B0><CF>*<B2><EC><E7>9<98><08>WF<88><A1><B8>K<BC><D2><0D>7<E9>-<1C>h<9A>[<BD><84>Z<99><88>Q<0C><9A><96><EE>D]L<1D><A3>W<AD>=<14>-^<8B><C5><D6>DT<92><12>1~z5R'<8B><F8><C6>{_<BF>e<0F><FD><AF>W~<F2>}{3o<EF>k<A6>Sj<DE>;<A1><09><14><DD>>+l<CD>8<CF>Y<99><88>y<F0>X<BF><86><C8>'<E0><9E><91>	
	^

Command Pocket

Byte 0	Byte 1 or Byte 1-3	Byte 2~
Command	Type	Data
I	1	<01><00><A2><05><00><00><00><00><01><01><03><03><01><00><01><80><14><C3><12><D4><88><A7><09><88><A4><F2><19><D5><D6>~y<8F><DC><A0><A7><0D><90>fc<13>:p<98><1E>a&<F9>+(<8B><ED><98><D6><97><82><CC><A8><C5><94><B0><CF>*<B2><EC><E7>9<98><08>WF<88><A1><B8>K<BC><D2><0D>7<E9>-<1C>h<9A>[<BD><84>Z<99><88>Q<0C><9A><96><EE>D]L<1D><A3>W<AD>=<14>-^<8B><C5><D6>DT<92><12>1~z5R'<8B><F8><C6>{_<BF>e<0F><FD><AF>W~<F2>}{3o<EF>k<A6>Sj<DE>;<A1><09><14><DD>>+l<CD>8<CF>Y<99><88>y<F0>X<BF><86><C8>'<E0><9E><91>

Command Type

Command Format (ASCII – Hex)	Description

0[01H 16H] (or 30H 01H 16H)	Show Stored Key's Index and RID
1 (or 31h)	Load RSA Key
5 (or 35h)	Load Test Key and Test RSA Chip
FFH 00H 00H	Erase all Key Entry

Command Data

Data	Description
Entry Index	1 byte in binary format, must be 1-16.
Total Len	Total length of rest data, 2 bytes in binary format.
RID Len	1 byte in binary format, must be 5.
RID	5 bytes in binary format
CAPKI Len	1 byte in binary format, must be 1.
CAPKI	Key Index, 1 byte in binary format.
Exp Len	1 byte in binary format, must be 1 or 3.
Exponent	1 or 3 bytes in binary format.
Mod Len	1 byte in binary format, Max is 248.
Modulus	1-248 bytes in binary format.
Sha_1	Len—1 byte in binary format, must be 0 or 20.
Sha_1	20 bytes in binary format, if present.

I1 command example:

Data	Value
RID	0000000001
CA Index	03
Modulus	14C312D488A70988A4F219D5D67E798FDCA0A70D906663133A70981E6126F92B288BED98D69782CCA8C594B0CF2AB2ECE7399808574688A1B84BBCD20D37E92D1C689A5BBD845A9988510C9A96EE445D4C1DA357AD3D142D5E8BC5D644549212317E7A3552278BF8C67B5FBF650FFDAF577EF2297B336FEF6BA6536ADE3BA109
Exponent	010001
Sha_1 Value	DD3E2B6CCD38CF59998879F058BF86C827E09E91
Command Form: I1<01><00><A2><05><00><00><00><00><01><01><03><03><01><00><01><80><14><C3><12><D4><88><A7><09><88><A4><F2><19><D5><D6>~y<8F><DC><A0><A7><0D><90>fc<13>:p<98><1E>a&<F9>+(<8B><ED><98><D6><97><82><CC><A8><C5><94><B0><CF>*<B2><EC><E7>9<98><08>WF<88><A1><B8>K<BC><D2><0D>7<E9>-<1C>h<9A>[<BD><84>Z<99><88>Q<0C><9A><96><EE>D]L<1D><A3>W<AD>=<14>-^<8B><C5><D6>DT<92><12>1~z5R'<8B><F8><C6>{_<BF>e<0F><FD><AF>W~<F2>}{3o<EF>k<A6>Sj<DE>;<A1><09><14><DD>>+l<CD>8<CF>Y<99><88>y<F0>X<BF><86><C8>'<E0><9E><91>	

Note: These values are used for testing purposes.

5.1.14. w (77H) – Exception File

Adds or processes PAN in the Exception File. Primary Account Numbers kept by this black list will be

denied for transactions.

Command Pocket

Byte 0	Byte 1	Byte 2~
Command	Type	Data
w	2	<10>6011111111111117

Command Type

ASCII – Hex Value	Description
0 (or 30h)	Erase Exception File
1 (or 31h)	Report counts of PANs in the Exception File
2 (or 32h)	Add a PAN to the file, 272 entries max.
3 (or 33h)	Query if a PAN exists in the Exception File
4 (or 34h)	Request a certain PAN from the Exception File

Command Data

Type	Description
2 (or 32h)	data length(1 byte) + PAN(up to 19 bytes ASCII '0'~'9')
3 (or 33h)	
4 (or 34h)	2 bytes long, range from 0000h to 010Fh

Response data format

Type	Description
1 (or 31h)	Return 2-byte binary number -- the total number of PANs in the file.
3 (or 33h)	Return '^' if PAN exists; else, return '*'.
4 (or 34h)	Return primary account number; else, return 00h.

w1 Example:

Host Command	Reader Response Example
w1	
	<00><02>
w2<10>6011111111111117	
	^
w3<10>6011111111111117	
	^
w4<00>02>	
	<10>6011111111111117

5.1.15. L (4CH) – Led On

This command is used to choose which Green Led shall turn on.

Example:

Host Command	Reader Response Example
L1	
	^

Note: This command is running in Self-Arm Disable mode.

5.1.16. l (6CH) – Led Off

This command is used to choose which Green Led shall turn off.

Example:

Host Command	Reader Response Example
l1	
	^

Note: This command is running in Self-Arm Disable mode.

5.1.17. ((28H) – Led Flash

This command is used to choose which Green Led shall flash.

Example:

Host Command	Reader Response Example
(1	
	^

Note: This command is running in Self-Arm Disable mode.

5.2. General Application

The default setting of the UIC680 reader, Self-Arm mode, is mainly used to simplify the process so that the host does not need to communicate back and forth with the reader. In this situation, the UIC680 acts like a general magnetic stripe card reader. Whenever it senses the card it will try to decode the card data automatically and send out the decoded data to the host if the process is successful. Otherwise, no information is sent out.

If the application would like to take the whole control on the reader, we recommend the user to use the “Host-Polled” mode instead of the “Self-Arm” mode. It can be done by either sending “Self-Arm” disable command or changing default setting in the reader configuration.

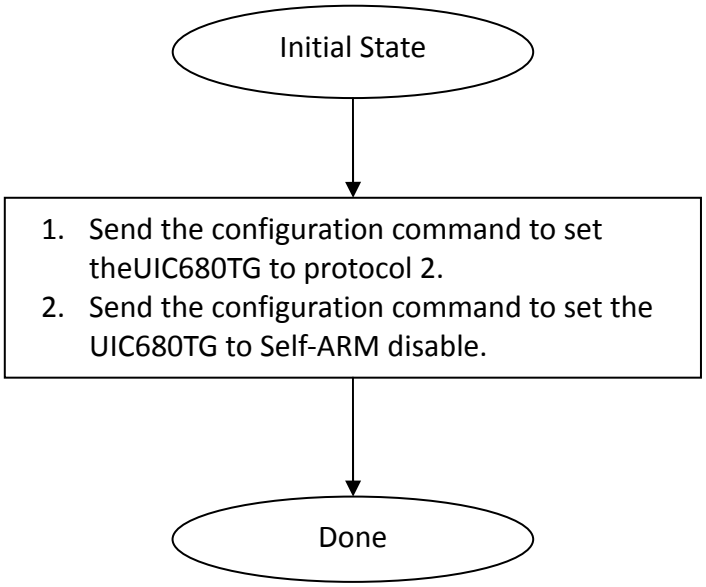
Once the UIC680 receives the Self-Arm disable command, ‘H0’ (see the command description section), it will turn off the auto-read function and then wait for the “Arm-to-Read” command, ‘P’ (50h) prepared for the next transaction. Since the Self-Arm disable command won’t change the EEPROM setting, the UIC680 will turn back to the Self-Arm mode in the next power cycling. Besides, the Self-Arm enable command, ‘H1’, can also bring the UIC680 back to the Self-Arm mode.

To disable the Self-Arm mode permanently, the host needs to set the EEPROM value of the UIC680. The configuration command ‘SA' (see the Configuration Guide) saves the setting into the EEPROM of the UIC680 and keeps the value until the next change.

We recommend users to use Protocol 2 (USI2) in their “host-polled” applications. This protocol contains the header, message counter and block check character. This is better than using Protocol 0(USI0) or Protocol 1(USI1) at it can prevent the data to be misinterpreted but requires more redundant bytes.

5.3. Host Poll Mode / Self Arm Mode Command Description

In this example, we assume that the UIC680 is in factory default setting and the user would like to change the setting to protocol USI2 and Self-Arm disable mode.



This process should be done only once to set the UIC680 to the proper state.

Due to the EEPROM life limitation, it is recommended not to change the EEPROM settings very frequently. Normally, the configuration setting is done in the factory production stage. Please contact the UIC Sales representative for more detail information.

Self-Arm Mode transaction process example flow

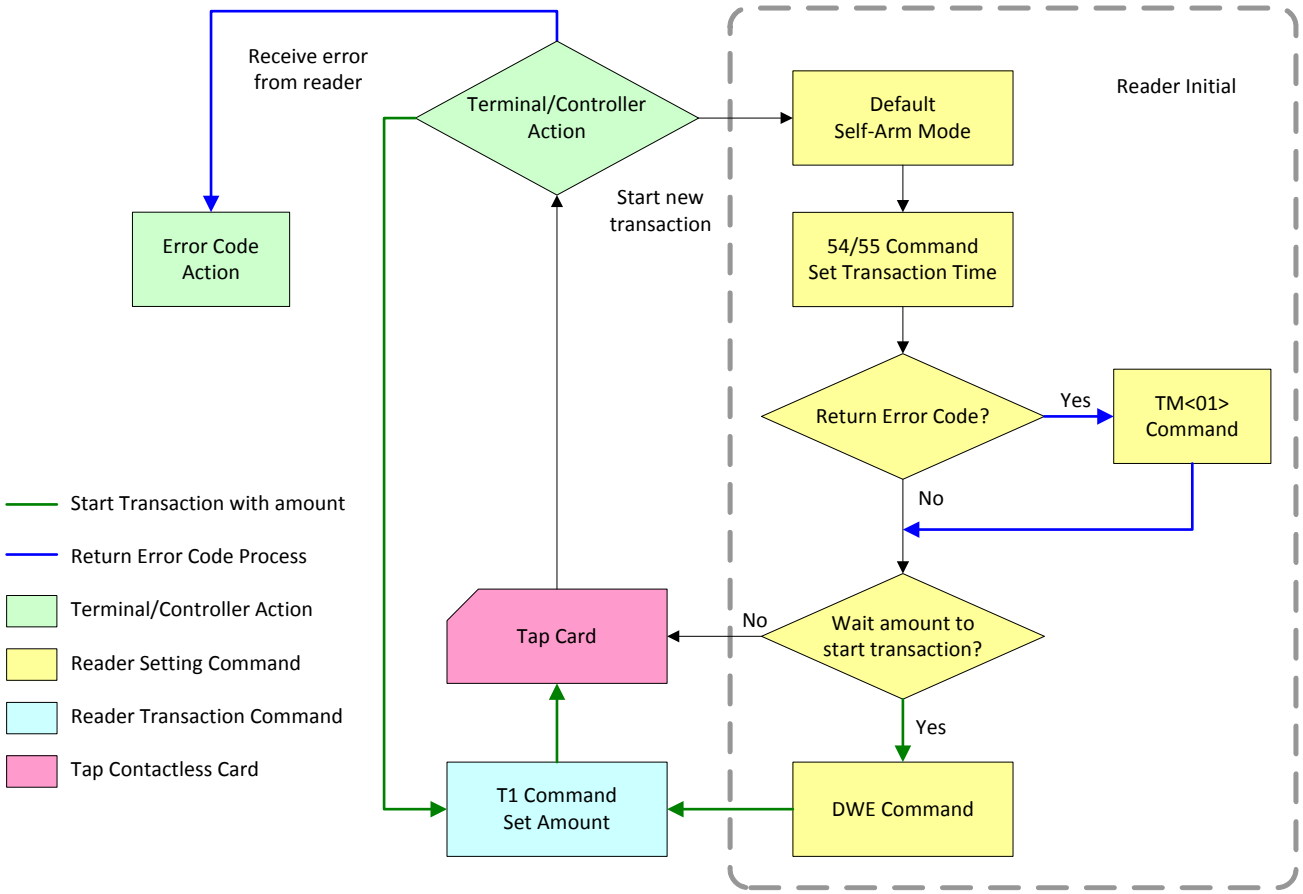


Figure 5-1

Host Poll Mode transaction process example flow

In this example, assume the UIC680 is in protocol USI2 and Self-Arm disable mode.

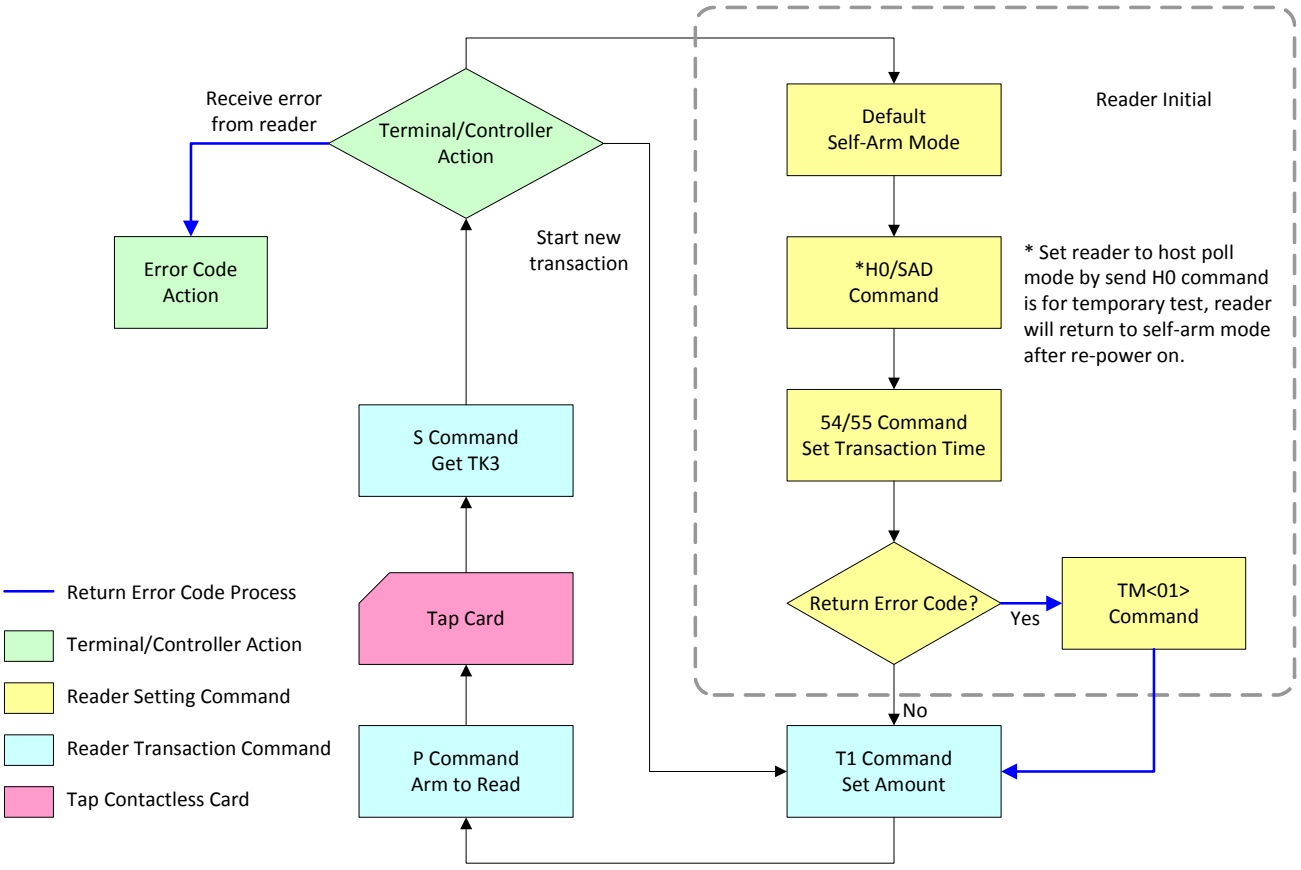


Figure 5-2

After the host issues the Arm-to-Read command, the UIC680 will check if any payment card is detected in the reading zone or any magnetic stripe card is swiped (the magnetic stripe reader is optional device). No matter the card is decoded successfully or not, it will return the '^' to indicate that the card has been read. The host can issue the 'Q', 'R', 'S' commands to retrieve the card data accordingly.

New TLV commands Operation Processing

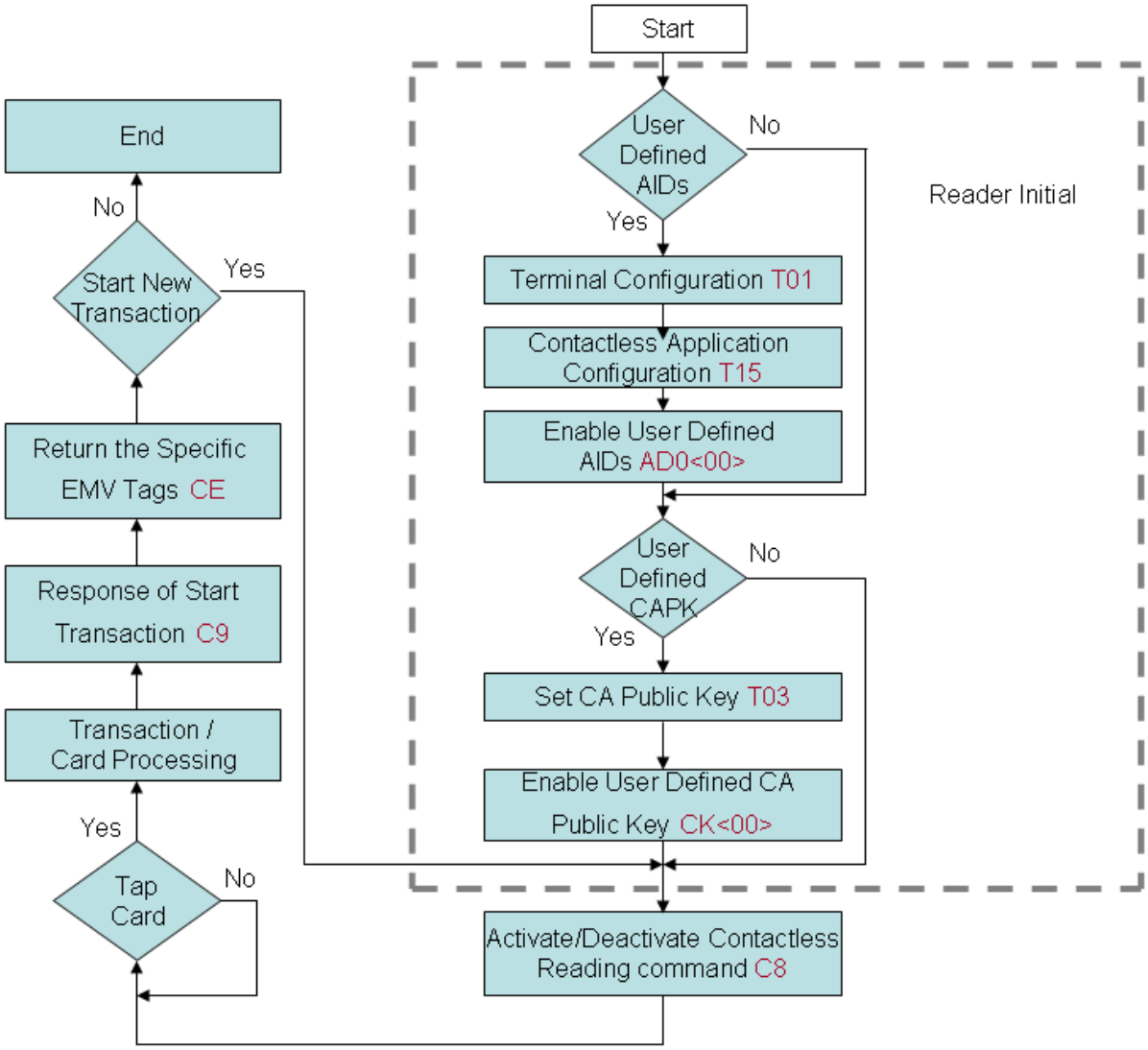


Figure 5-3

5.3.1. H (48H) – Self-Arm function disable/enable

Used for controlling Contactless auto read function temporarily.

Command Pocket

Byte 0	Byte 1
Command	Type
H	0

Command Type

ASCII - Hex 1 Byte Value	Description
0 (or 30h)	Self Arm Disable
1 (or 31h)	Self Arm Enable

Example:

Host Command	Reader Response Example
H0	
	^

Note: UIC680 cannot perform the Self-Arm enable command for the contactless payment card reading under the following conditions:

1. The payment card is decoded successfully and the UIC680 is waiting for the card to be removed from the reading zone.
2. The payment card is failed to decode and the UIC680 is waiting for the card to be removed from the reading zone.

5.3.2. SAx(53h 41h x) — Self-Arm Mode Enable/Disable

Note: the command is only using in BLP protocol

Command Pocket

Byte 0-1	Byte 2
Command	Enable/Disable
SA	E/D

Command Type

Type	Description
D (44h)	Disable
E (45h)	Enable

Example:

Host Command	Reader Response Example
SAE	
	^

5.3.3. TMx(54h 4Dh x) — Set Error Code output Enable/ Disable

Note: the command is only using in BLP protocol

Command Pocket

Byte 0-1	Byte 2
Command	Enable/Disable
TM	<01>/<00>

Command Type

Type	Description
00	Disable
01	Enable

Example:

Host Command	Reader Response Example
TM<01>	
	^

5.3.4. P (50H) – Arm to Read

1. Clears data buffers.
2. Transmits command acknowledgement (‘^’ 5EH) if successful.
3. Waiting for and detect approaching card.
4. The LED1 will light on and then turn off after a successful reading or a MIFARE card being detected.

Example:

Host Command	Reader Response Example
P	
	^

Note:

1. After an Arm to Read command is received and acknowledged the only valid commands that will be accepted for execution are: <ESC> “Abort” and ‘$’ “Status”.
2. Reader will NOT send out track data automatically; the host should issue the ‘Q’, ‘R’, ‘S’, ‘U’ commands to get the corresponding track data.
3. In the Self-Arm mode, it is not necessary to send this command. If this command is sent, it will temporarily override the Self-Arm mode.

5.3.5. p (70H) – Arm to Read (Used for Manufacturing Test Only)

Equivalent to the 'P' command, except the card read acknowledgement which is not the ‘^’ character.

Example:

Host Command	Reader Response Example
p	
	^

It will report a ‘(‘(28H) byte if the card media is detected, and a ‘)’(29H) byte when the media detection goes inactive.

5.3.6. <ESC> (1BH) – Abort Arm to Read

1. Clear the data buffers.
2. Aborts the Arm to Read command.

Example:

Host Command	Reader Response Example
<1B>	
	^

5.3.7. Q, R, S – Get Transmit Track Data

Q (51H) Transmit Track 1 data
R (52H) Transmit Track 2 data
S (53H) Transmit Track 3 data

Example:

Host Command	Reader Response Example
S	
	+300=AABBCCDDEEFF1122=06011103900000=09861AA8=0003=A0800000=0000000000=0000=121207=000000000000=0840=2000=0840=000000000000=000888=25=0000=3030303030303030=303030303030303030303030303031=01=6000000001=======00=000000010000==2000========07=08?

5.3.8. U (55H) – Get Transmit Track 4 data

1. Detects card type automatically and processes data in the read buffer.
2. If error is detected, transmits relevant error response ('*' or '+') (see Response to the Host section). Else, transmits the track data in ASCII.
3. The DUKPT (TDes and AES) encrypted output data format: | Encrypted track data | DUKPT KSN | Encrypted Session ID | .
4. The RSA encrypted output data format: Base64[RSA Encrypt Data].

5.3.9. DWx(44h 57h x) – Set Wait Amount mode

Note: the command is only using in BLP protocol

Command Pocket

Byte 0-1	Byte 2
Command	Enable/Disable
DW	E/D

Command Type

Type	Description
D (44h)	Disable
E (45h)	Enable

Example:

Host Command	Reader Response Example
DWE	
	^

5.3.10. T (54H) – Transaction Command

This command is used to view and manipulate transaction activities.

Example:

Host Command	Reader Response Example
T1<00><00><00><00><01><00>	
	^

Command Format

Byte 0	Byte 1	Byte 2 ~
Command	Type	Data
T	1	<00><00><00><00><01><00>

Command Type

ASCII – Hex Value	Description
0 (or 30h)	Erase all Transaction records
1 (or 31h)	Enter Amount
2 (or 31h)	Read Transaction Record
B (or 42h)	Query records Count
5 (or 35h)	Clear Amount

Command Data

Command Type	Data Description
T1<Amount>	6 bytes in numeric format, use once only.
T2<Record>	2 bytes in binary format, decide which record to read; range from 0001h to 0018h.
TB<Count> (Get Data)	2 bytes in binary format.

Note: Record data of 'T2' command includes Transaction Date and Tracks data.

5.3.11. (C8H) – Activate/Deactivate Contactless Reading command

Purpose of the command: This command can activate the reader to start to read the card.

Note: user shall set AAE command in BLP protocol to enable the new TLV commands (C8h, C9h, CEh).

Command

Byte 1	Byte 2	Byte 3+n
C8	State, 1 byte	Data Field, n bytes

State

Parameter	Description
00h	Deactivate the reader and STOP Signal (Paypass)
01h	Activate the reader
02h	CLEAN Signal (Paypass)

State - 01H, Require TLV Parameters				
Tag	Description	Format	Length	Remarks
5F2A	Transaction Currency Code	b	2	Options
9A	Transaction Date	b	3	Options
9C	Transaction Type	b	1	Options
9F02	Amount, Authorized	b	6	Options
9F03	Amount, Other	b	6	Options
9F21	Transaction Time	b	3	Options
DF8104	Balance Read Before Gen AC (Paypass)	b	6	Options
DF8105	Balance Read After Gen AC (Paypass)	b	6	Options
FFFF8205	Command Time Out (ms)	b	4	Options, all '00' for Disable, <00><00><27><10> means 10000ms

…	…			

State - 02H, CLEAN Signal in Paypass			
Data Field	Value	Description	Remarks
1	01H	Clean up the Torn Transaction Log	

Response

Result	Description
^	Success
*	Bad parameters
!	Can't execute

1. The reader will reject the command if the data is non-TLV format or with invalid coding.
2. For the unknown tags or tags with incorrect values, it will be ignored by the reader.
3. For the duplicate tags, the reader always overwrites the earlier tag value by the latter tag.
4. The reader accepts partial data update TLV data.

Example:
Set Amount, Authorized to be $15.00 and start to read the card

Host	UIC680
<c8><01><9f><02><06><00><00><00><00><15><00><5f><2a><02><09><78><9c><01><00><ff><ff><82><05><04><00><00><00><00>	
	^

5.3.12. (C9H) – Response of Start Transaction

Purpose of the command: This command is to return the result of Start Transaction (command C8h). The controller should send '^' to acknowledge upon receiving the data.

Format

Byte 1	Byte 2	Byte 3	Byte 4 + n
C9h, 1 byte	Error Code, 1 byte	POS Entry, 1 byte	Card Data

Error Code

Value	Description
00	Online Required

01	Offline Approved
02	Offline Declined
03	Card not support
04	Initiation error
06	Empty candidate list
07	C8 Command Time out
08	Card block
0B	Transaction error
0C	Authentication error
0D	More card
0F	Time out of Online Required (DPAS)
12	Try Again *1
20	See Phone *1
39	Transaction Terminate
60	Online Approved
61	Online Declined
62	Online Approved of Issuer Script
63	Online Decline of Issuer Script
64	Unable Go Online Offline Approved
65	Unable Go Online Offline Declined
86	Empty candidate list, try other interface
8C	Authentication error, try other interface

Note

*1: In order to meet the requirement of Kernel, the Host shall resend C8 command with all same parameters in 1st transaction.

POS Entry

Bit 7	Bit 6	Bit 5 – 0	Description
0	0	000001	Contactless – Visa qVSDC Card
0	0	000010	Contactless – Visa MSD Card
0	0	000011	Contactless – PayPass Mchip Card
0	0	000100	Contactless – PayPass Magstripe Card
0	0	000101	Contactless – AMEX EMV Card
0	0	000110	Contactless – AMEX MSD Card
0	0	000111	Contactless – Discover DPAS Card
0	0	001000	Contactless – Discover Zip Card
0	0	001001	Contactless – Google Wallet
0	0	001010	Contactless – ISIS
0	0	010000	Contactless – Mifare
0	1	000001	Mag stripe card
1	0	000000	No payment card, no additional data available.

Bit 7 = 0, the additional data is available. Bit 7 = 1, no additional data.

Card Data

The number of the track in the card data is set by CKx. By default, all 3 tracks are output. It

is recommended to disable track 3, since the EMV tag can also be retrieved by CE command.

Example:
Receive:
<C9><00><04>%B5413123456784808^SMITH/JOHN^09061013311133312222222325111 13?;5413123456784808=090610191229932545 73?

5.3.13. (CCH) – Transaction Completion

Purpose of the command: This command is the last step in EMV transaction flow. After received this command, the reader will send the acquirer data (if one line) to the card and inform the transaction is complete. The reader will do the following processes upon the transaction type (may or may not perform it's upon acquirer's requirement and response):

- External Authenticate
- Script Processing
- 2nd Gen AC
- Completion

Command

Byte 1	Byte 2	Byte 3-4	Byte 5-6	Byte 7+n
CC	Host Decision	ARC (8A)	Scripts Total Length	Scripts (71/72), Var bytes

Host Decision	
Value	Description
00	Host response received*
01	Reserve for backward compatibility
02	No response from Host, Can't go online, or the host not available

* The application should put the received ARC message in the ARC field of the command.

ARC	
Value	Description
30h 30h	Approve
30h 35h	Decline

Scripts format

Tag + Value length + Value + Tag + …..

Scripts example

Scripts1: <71><08><31><32><33><34><35><36><37><38>

Scripts2: <72><04><41><42><43><44>
<71><08><31><32><33><34><35><36><37><38><72><04><41><42><43><44>

Important:

For the customized tag list, it is highly recommend having the default tags included. They are mediatory data for many acquirers.

Transaction Flow

The controller	Data Direction	The Reader
'CC'	→	
	←	'CD'

Example:

Host	UIC680
<CC><01><30><35><00><00>	
	^
	<CD><61><08>

5.3.14. (CDH) – Response of Transaction Completion

Purpose of the command: This command is to return the result for the command CCh (**Transaction Completion**).

Format

Byte 1	Byte 2	Byte 3
CDh, 1 byte	Error Code, 1 byte	POS Entry, 1 byte

Error Code

Value	Description
03	Card Not Support
04	Issuer Script Error
0B	Transaction Error
10	Command Sequence Error
60	Online Approved (note 1)
61	Online Declined (note 2)
62	Online Approved and Issuer Script Result
63	Online Declined and Issuer Script Result
64	Unable go Online, Offline Approved
65	Unable go Online, Offline Declined
66	Unable go Online, Offline Declined and Try Other Interface

Note 1: The transaction is approved. The terminal should send the message to the bezel for the card removal.

Note 2: The transaction is declined. The terminal should send the message to the bezel for the card removal or changing another card.

POS Entry

Please refer to the “POS Entry” table of the command “C9h” for the value.

5.3.15. (CEH) – Return the Specific EMV Tags

Purpose of the command: to retrieve a list of the specified EMV tags

EMV Tags please refer to T15 command - Contactless Application Configuration Setup

Note: user shall set AAE command in BLP protocol to enable the new TLV commands (C8h, C9h, CEh).

Command

Byte 1	Byte 2+n
CE	Data Object List * (n bytes)

*Each object is expressed by tag number, and 78H is used to delimit each object. For example, 9F12x9Ax9F02x…

Response

Result	Description
Tag result in TLV format	Only present if the result is successful

Tag result inlcudes two bytes for the lenght of following TLV list

Byte 1, 2	Byte 3+n
Total Data Length **(non- TLV format)**	TLV Data Object List

During the paypass transaction, kernel will create two special Tags, called Signal Out and Message Out. User may read out and parse both of them to know the transaction result.
If the total data length is larger than the internal buffer in the reader and can’t be send out in one time, the reader will send out the Tag FFFF8214, Remain Tag Information, with first un-send out Tag Name. The maximum size of internal buffer is 2091 bytes.

Tag	Data Object Name	Format	Length (Byte)
FFFF8212	Signal Out (Paypass)	b	n
FFFF8213	Message Out (Paypass)	b	n
FFFF8214	Remain Tag Information (Send out by Reader)	b	4

Response (Only present if the result is failed)

Result	Description
*	Bad parameters
!	Can’t execute

Example:

Host ->	<- UIC680
<CE>9F02xFFFF8212xFFFF8213x9F26x5F24x82x50x5Ax5F34x9F36x9F09x9F27x9F34x84x9F1Ex9F10x9F33x	
	<08><21><9F><02><06><00><00><00><00><02><00><FF><FF><82><12><82><06><F3><00><D6><DF><81><29><08><30><F0><F0><00><38><F0><FF><00><FF><81><06><0F><9F><42><02><09><78><DF><81><15><06><00><00><00><00><00><FF><FF><81><05><81><B2><9F><02><06><00><00><00><00><02><00><9F><26><08><3C><F5><A2><F9><B2><69><EB><3E><5F><24><03><09><12><31><82><02><58><80><50><0A><4D><61><73><74><65><72><43><61><72><64><5A><08><54><13><33><00><89><60><10><75><5F><34><01><00><9F><36><02><16><5E><9F><09><02><00><02><9F><27><01><80><9F><34><03><5F><03><02><84><07><A0><00><00><00><04><10><10><9F><1E><08><30><30><30><30><30><30><30><31><9F><10><12><01><10><A0><00><09><22><80><00><00><00><00><00><00><00><00><00><03><FF><9F><33><03><00><08><08><9F><1A><02><00><56><9F><35><01><22><95><05><80><40><00><00><00><57><11><54><13><33><00><89><60><10><75><D0><91><22><01><01><23><40><18><42><5F><2A><02><08><40><9A><03><14><04><01><9C><01><00><9F><37><04><D8><13><52><71>......<FF><FF><82><13><38><00><1A><DF><81><16><16><1E><04><00><00><00><00><00><00><00><00><00><00><00><00><00><00><00><00><00><00><00><00><00><1A><DF><81><16><16><1B><00><00><00><00><00><00><00><00><00><00><00><00><00><00><00><00><00><00><00><00><00><00>**<FF><F**

	F><82><14><02><9F><26>
<CE>9F26x5F24x82x50x5Ax5F34x9F36x9F09x9F27x9F34x84x9F1Ex9F10x9F33x	
	<00><72><9F><26><08><3C><F5><A2><F9><B2><69> <EB><3E><5F><24><03><09><12><31><82><02><58> <80><50><0A><4D><61><73><74><65><72><43><61> <72><64><5A><08><54><13><33><00><89><60><10> <75><5F><34><01><00><9F><36><02><16><5E><9F> <09><02><00><02><9F><27><01><80><9F><34><03> <5F><03><02><84><07><A0><00><00><00><04><10> <10><9F><1E><08><30><30><30><30><30><30><30> <31><9F><10><12><01><10><A0><00><09><22><80> <00><00><00><00><00><00><00><00><00><03><FF> <9F><33><03><00><08><08>

5.4. Contactless Card Operation Command Description

Mifare 1K operation process

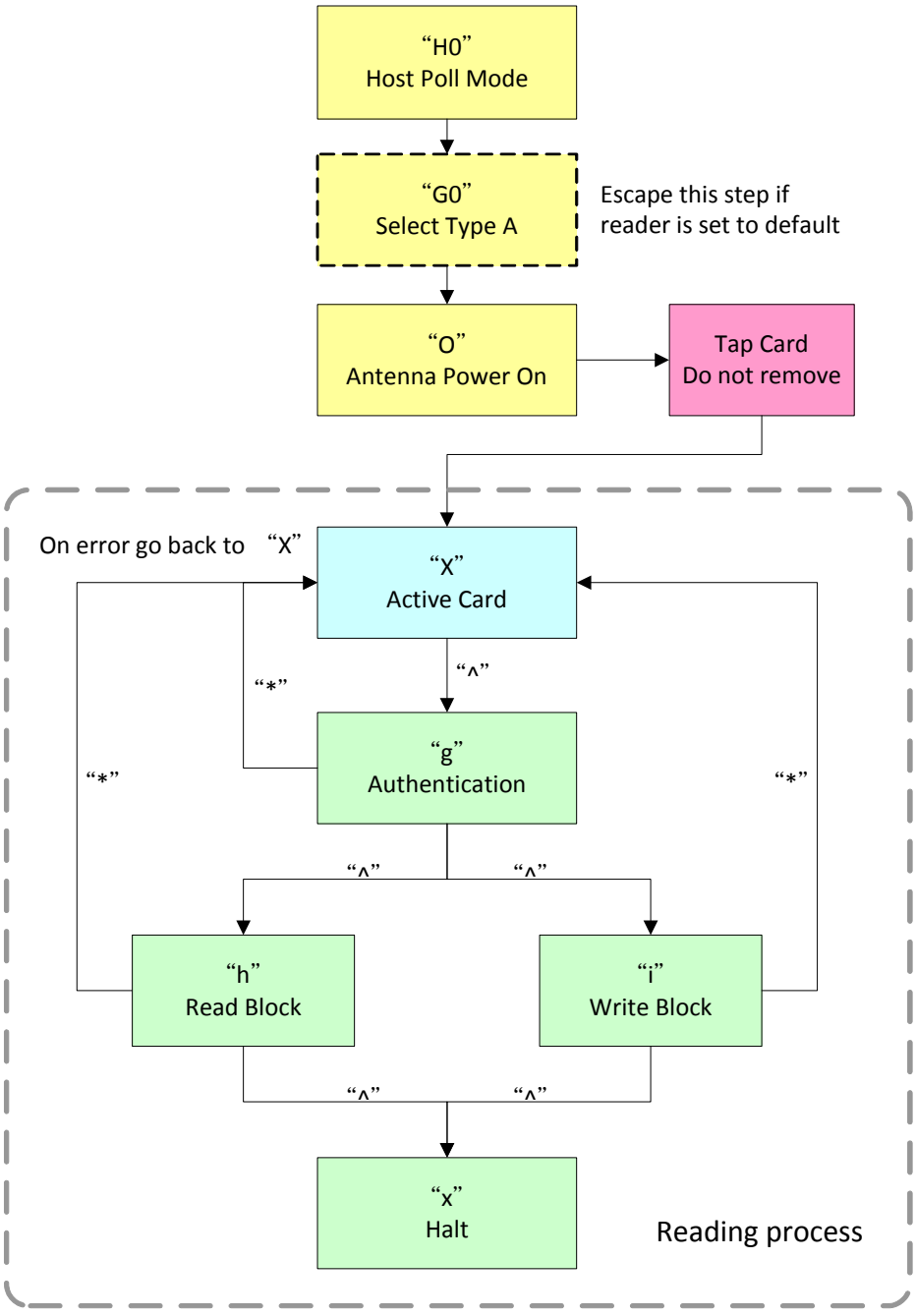


Figure 5-4

5.4.1. G (47H) – ISO 14443 Type Protocol Select

Selects which manual command operated, ISO 14443 Type A or B.

Command Pocket

Byte 0	Byte 1
Command	Type
G	0

Command Type

Type	Description
0 (30h, ASCII Hex)	ISO 14443 Type A
4 (34h, ASCII Hex)	ISO 14443 Type B

Note: The default contactless smart card type is Type A after power up.

Example:

Host Command	Reader Response Example
G0	
	^

5.4.2. O (4FH) – Antenna power ON

Applies power on the antenna. This command is for manual command operation.

Example:

Host Command	Reader Response Example
O	
	^

Note: If the reader is in Self-Arm mode. The antenna power cannot be turned on by manual command setting.

5.4.3. o (6FH) – Antenna power OFF

Turns the antenna power off.

Example:

Host Command	Reader Response Example
o	
	^

Note: If the reader is in Self-Arm mode. The antenna power cannot be turned off by manual command setting.

5.4.4. b (62H) – Request

Request command.

Command Pocket - ISO 14443 type A

Byte 0	Byte 1
Command	Req command
b	52

The request command code is ISO 14443 type A. It can be either 26(REQA) or 52(WUPA).
Note: If the [Req command] field does not appear in the request command, reader will set the request mode to WUPA automatically.

Command Pocket - ISO 14443 type B

Byte 0	Byte 1	Byte 2
Command	AFI	PARAM
b	00	00

Note: user shall set G4 to select ISO 14443 Type B while using b<00><00>.

Command Description

Byte	Description
AFI(optional)	Binary Hex(00h to FFh), please refer to ISO 14443-3 for detailed information.
PARAM(optional)	Binary Hex(00h to FFh), please refer to ISO 14443-3 for detailed information.

If the [AFI] and [PARAM] fields do not appear in the request command, reader will set the request mode to WUPB automatically.

Success Response Data Format

Message Type	Description
ATQA	2 bytes, type A, Binary Hex
ATQB	12 bytes, type B, Binary Hex

Note: If reader response '*' = No card response or No power on the antenna

5.4.5. c (63H) – Anticollision(type A)/Slot-MARKER(type B)

In type A mode, reader sends the ANTICOLLISION command to the card.
In type B mode, reader sends the Slot-MARKER command to the card.

Command Pocket -

Card Type	Byte 0	Byte 1
ISO 14443 type A	c	
ISO 14443 type B	c	APn

Command Description

Byte	Description
APn	Anticollision Prefix byte, please refer to ISO 14443-3 for detailed information.

Success Response Data Format

Card Type	Description
ISO 14443 type A	PICC serial number for type A(Binary Hex)
ISO 14443 type B	PICC send ATQB(12 bytes, Binary Hex) for type B

Note: If reader response '*' = No card response or No power on the antenna

5.4.6. f (66H) – Select(type A)/Attrib(type B)

In type A mode, reader sends the SELECT command to the card.
In type B mode, reader sends the ATTRIB command to the card.
Example:

Host Command	Reader Response (ISO 14443 Type A)	Reader Response (ISO 14443 Type B)
f		
	'^' + SAK(1 byte)	'^' + MBLI/CID(1 byte)

'*' - No card response or No power on the antenna

5.4.7. g (67H) – MIFARE Classic Card Authentication

An authentication command has to be carried out before any operation in order to allow further commands.

Command Pocket

Byte 0	Byte 1-3	Byte 4	Byte 5
Command	Block number	Key number	Key type
g	001	0	A

Or

Byte 0	Byte 1-3	Byte 4	Byte 5-16
Command	Block number	Key Type	Key
g	001	A	FFFFFFFFFFFF

Authenticate the card with the key stored in EEPROM.

Block Number – 2 Types

Block Number Type	Data Format
000 to 255	30h30h30h to 32h35h35h, ASCII Hex
B<00><00> to B<00><FF>	42h00h00h to 42h00hFFh, ASCII Hex

Key Information

Field	Length	Description
Key Number	1 Byte	0 to 4(30h to 34h, ASCII Hex)

Key Type	1 Byte	A or B(41h or 42h)
Key	16 Byte	0 to 9 or A to F(30h to 39h or 41h to 46h, ASCII Hex)

Example:

Host Command	Reader Response Example
g001AFFFFFFFFFFFF	
	^

5.4.8. h (68H) – MIFARE Classic Card Read Block(Supports MIFARE Ultralight)

MIFARE Classic card read command.

Command Pocket

Byte 0	Byte 1-3
Command	Block number
h	001

Block Number – 2 Types

Block Number Type	Data Format
000 to 255	30h30h30h to 32h35h35h, ASCII Hex
B<00><00> to B<00><FF>	42h00h00h to 42h00hFFh, ASCII Hex

Example:

Host Command	Reader Response Example
h001	
	1111111111111111

Response Block data(16 bytes, Binary Hex)

5.4.9. i (69H) – MIFARE Classic Card Write Block(Supports MIFARE Ultralight)

MIFARE Classic card write command.

Command Pocket

Byte 0	Byte 1-3	Byte 4-7 or Byte 4-19
Command	Block number	Block data
i	001	1234123412341234

Block Number – 3 Types

Block Number Type	Data Format	Description
000 to 255	30h30h30h to 32h35h35h, ASCII Hex	General MIFARE block
B<00><00> to B<00><FF>	42h00h00h to 42h00hFFh, ASCII Hex	

<00><00> to U<00><FF>	55h00h00h to 55h00hFFh, ASCII Hex	MIFARE Ultralight

Block Data

Card Type	Length
MIFARE Ultralight	4 Bytes
Others	16 Bytes

Example:

Host Command	Reader Response Example
i0011234123412341234	
	^

5.4.10. t (74H) – MIFARE Classic Card Value Operation

Value Block Operation commands.

Command Pocket

Byte 0	Byte 1-3	Byte 4	Byte 5-8	Byte 9-11
Command	Block number	Operation mode	Value	Transfer block
t	001	3	00	02

Block Number – 2 Types

Block Number Type	Data Format
000 to 255	30h30h30h to 32h35h35h, ASCII Hex
B<00><00> to B<00><FF>	42h00h00h to 42h00hFFh, ASCII Hex

Operation Mode

ASCII – Hex Value	Description
0 (or 30h)	Decrement
1 (or 31h)	Increment
2 (or 32h)	RFU
3 (or 33h)	Decrement and transfer to the different block
4 (or 34h)	Create MIFARE Value in the block

Others

Field	Description
Value	Binary Hex from 00h to FFh
Transfer block	For option 3 only, the data format is the same as [Block number]. If [transfer block] is not given, reader will regard it as normal Decrement command.

Example:

Host Command	Reader Response Example
t00140002	
	^
t00100001	
	^
t00110001	
	^
t00130001002	
	^

5.4.11. W (57H) – ISO 14443A Detection

Detects ISO 14443A cards.

Response 'M' if detects an ISO 14443A card.

Type of Card	Reader Configuration	
	Mifare Card Support	
Mifare Standard 1K	N/A	"M2"
Mifare Standard 4K	N/A	"M3"
Mifare Ultralight	N/A	"M1"
Mifare Ultralight C	N/A	"M1"
Mifare DESFire	N/A	"M4"
Mifare Plus	N/A	"M5"
MIFARE Mini	N/A	"M6"
MPCOS Gemplus	N/A	"M7"
Jewel for Innovision	N/A	"M8"
JCOP31	N/A	"M9"
Not MIFARE card or Not supported card	N/A	"M0"
No card response or No power on the antenna	N/A	"*"

5.4.12. X (58H) – MIFARE Classic Card Activation(Supports MIFARE Ultralight)

Performs request/anticollision/select command to activate the card.
It is also can be used for any ISO 14443 compatible cards.

Card Type	Description
Type A	ATQA/SAK/serial number if command executed successfully
Type B	ATQB(12 bytes) if command executed successfully

Example:

Host Command	Reader Response Example
X	
	<04><00><08>d<AC>Eq

5.4.13. u (75H) – MIFARE Classic Card Read Sector

MIFARE Classic card read sector command.

Command Pocket

Byte 0	Byte 1-3
Command	Block number
u	001

Block Number – 2 Types

Block Number Type	Data Format
000 to 255	30h30h30h to 32h35h35h, ASCII Hex
B<00><00> to B<00><FF>	42h00h00h to 42h00hFFh, ASCII Hex

Note: For MIFARE Classic 4K, sectors 0~31 contains 4 blocks each and sectors 32~39 contains 16 blocks each.

Response Sector data (64/256 bytes, depending on the card) if command executed successfully

5.4.14. v (76H) – MIFARE Classic Card Write Sector

MIFARE Classic card write sector command.

Command Pocket

Byte 0	Byte 1-3	Byte 4~
Command	Sector number	Sector Data

Sector Number – 2 Types

Block Number Type	Data Format
000 to 255	30h30h30h to 32h35h35h, ASCII Hex
B<00><00> to B<00><FF>	42h00h00h to 42h00hFFh, ASCII Hex

Sector Data

For MIFARE Classic 4K, sectors 0~31 contains 4 blocks each and sectors 32~39 contains 16 blocks each. That is, the sector data should be 64 bytes for MIFARE 1K card, 64/256 bytes for MIFARE 4K card.

5.4.15. J (4AH) – Activate PICC cpu card

PICC cpu card activation command. The Antenna POWER ON command has to be sent first.

Response ATS (type A) or PUPI (type B) if command executed successfully

5.4.16. j (6AH) – Load MIFARE Key(Supports MIFARE Classic only)

Saves up to 5 key sets for MIFARE Classic card application.
Note: For security reasons, there is no way to retrieve the keys.

Command Pocket

Byte 0	Byte 1	Byte 2~13
Command	Key number	Key data

Key Information

Field	Data Format
Key number	0 to 4 (or 30h to 34h, ASCII Hex)
Key data	0 to 9 or A to F(or 30h to 39h or 41h to 46h, ASCII Hex)

5.4.17. F (58H) – Identify MIFARE Card Type

Reports MIFARE Card type. It also can be used for any ISO 14443A compatible cards.

Host Command	Reader Response Example
F	
	Card Type*

Card Type*

Response	Description
1 (31H)	MIFARE Ultralight
2 (32H)	MIFARE 1K
3 (33H)	MIFARE 4K
4 (34H)	MIFARE DESFire
5 (35H)	MIFARE Plus 2K
6 (36H)	MIFARE Mini
7 (37H)	MPCOS Gemplus

8 (38H)	Jewel for Innovision
9 (39H)	JCOP31
0 (30H)	Not MIFARE card or Not supported card
'*'	No card response or No power on the antenna

Note: This command is only available after users successfully activate the MIFARE cards (after the 'f' or 'X' command).

5.4.18. x (78H) – Card HALT

Comment Card halt command.
Response '^' – Acknowledgement.
'*' – No power on the antenna.

5.4.19. y (79H) – Send DESELECT command

Sends ISO 14443 layer 4 DESELECT command to the card.

5.4.20. Z (5AH) – I/O to contactless CPU card with APDU format

The command is used to pass an APDU to the card where both data and an ISO status are expected in the response.

Command Pocket

Byte 0	Byte 1~ (262 Bytes max)
Command	APDU (Binary hex(00h to FFh))

If successful, the data from the ICC and the two bytes SW1/SW2 ISO 7816-4 response are returned. If unsuccessful, reader transmits '*'.

APDU Command Structure					
CLA	INS	P1	P2	P3 Lc or Le	Data (If Lc present)

APDU Response Structure		
Data (optional)	SW1	SW2

An Example of Mifare DESFire Operation

Host		UIC 680TG
H0 (Disable Self-Arm mode)	→	**Protocol 0**
	←	^ (Reader ACK)
O (Turn the antenna power on)	→	
	←	^ (Reader ACK)
Tap Mifare DES*Fire* card on the reader		
J (Activate PICC cpu card)	→	
	←	<06>uw<81><02><80> (Response ATS)
Z<90><60><00><00><00>* (I/O to contactless CPU card with APDU format)	→ 1st frame	GetVersion
	←	<04><01><01><01><00><18><05><91><AF>
Z<90><AF><00><00><00> (I/O to contactless CPU card with APDU format)	→ 2nd frame	GetVersion
	←	<04><01><01><01><03><18><05><91><AF>
Z<90><AF><00><00><00> (I/O to contactless CPU card with APDU format)	→ 3rd frame	GetVersion
	←	<04><93>=J<CC>"<80><BA><14>WY<00>!<10><91><00> (Successful operation) *Byte 1~7：Serial number* *Byte 8~12：Production batch number* *Byte 13：codes the calendar week of production* *Byte 14：codes the year of production* *Byte 15~16：SW1 & SW2*[*]
x (Set card to HALT state)	→	
	←	^ (Reader ACK)

5.4.21. z (7AH) – I/O to contactless card for block data exchange

The command is used to pass a block data to a card.

Command Pocket

[*] Reference document：mifare DES*Fire* product specification

Byte 0	Byte 1	Byte 2-5	Byte 5~ (384 Bytes max)
Command	Rx CRC mode	Wait time	Block data

Rx CRC Mode

Mode	Description
0 (30h)	Disable CRC transmission.
1 (31h)	Enable CRC transmission.

Note: The byte 1 of z command is Rx CRC Enable/Disable. The Tx CRC is always enabled and handles by Reader.

Others

Field	Description
Wait time	0000 to 9999(30h30h30h30h to 39h39h39h39h, ASCII Hex) in milliseconds.
Block data	Binary hex(00h to FFh), maximum 384 bytes.

If successful, the data from the ICC are returned.
If unsuccessful, reader transmits '*'.

Example:

Host Command	Reader Response Example
z12000<30><05>	
	1111111111111111

6. Acquirer Testing Related Configuration Settings

6.1. Commands

Some commands are provided here for the upper level application development (so called level 3). In general, these commands are required and needed only to set once before the deployment. They are mainly to configure the reader to the correct setting to accept the contactless payment transaction especially for PayPass M/CHIP and VISA qVSDC. It is possible to update the value in the field site later for the requirement being changed.

6.1.1 General Commands

The commands showed in the section are using the general command protocols such as protocol 0, 1, or 2. Refer to section 4.2.1 Transmission Protocol for the detail format.

6.1.2 Configuration Commands

The commands showed in the section are using BLP protocol. Refer to UIC680 configuration manual for the detail format.

6.1.2.1 CKx (43H 4BH x) – Set CA Public Key Type

In Level 3 testing, both Visa ADVT-qVSDC test and PayPass M-TIP test use CA public key which are different from Level 2 Type Approval Test, the default CA public key set in the reader is for Level 2 Type Approval Test, reader need to configure to use the CA public key which loaded into reader by "T03" command. It is also applicable for the real world transaction if the loaded key is the production key.

Configuration Type

Value	Description
<00>	Set the reader use User Key (Loaded into reader by I command)
<01>	Set the reader use Default CA Public Key (default value)

Command Packet

Byte 0-1	Byte 2

CK	Value

6.1.2.2 AD0 (41H 44D 30H x) – Set AID Type

The specific AID file for Contactless testing need to be loaded by "T15" command, the default setting of reader is configure to use default AID setting, for Level 3 testing, the reader need to configure to use user defined AID.
Note: user shall set T01 to setup terminal configuration and set T15 to setup contactless application configuration while using AD0<00>.

Configuration Type

Value	Description
<00>	Set the reader use User defined AID (Loaded into reader by T15 command)
<31>	Set the reader use Default AID. (Default value)

Command Packet

Byte 0-2	Byte 3
AD0	Value

6.1.2.3 VVx (56H 56H x) – Set Visa polling mode

The default setting of UIC680 is support MSD1.4.2 and VCPS 2.1 at the same time, but during the test session of ADVT-qVSDC testing, test case 19 to 28 need to terminate if DDA not perform or error by the card, if the bezel support MSD1.4.2, then the bezel will output track 1 and track 2 data to make transaction go online, this command is in purpose to configure the bezel to support VCPS 2.1 only.

Configuration Type

Value	Description
<02>	Visa auto polling mode (Support both MSD 1.4.2 and VCPS 2.1)
<03>	Support VCPS 2.1 only

Command Packet

Byte 0-1	Byte 2
VV	Value

6.1.2.4 UTx (55H 54H x) – Set TAC

The command is dedicated for PayPass. The appropriate parameters please refer to specifications below:
PayPass TIP PayPass – M/Chip Application Note #17, Page.8, Table 3.2

Note: This command is valid in the Self-Arm Mode or Arm to Read. For new TLV commands (C8h) shall set in the Terminal Configuration (T01) or Contactless Application Configuration (T15).

Configuration Type

Value	Description
0	Default
1	Denial
2	Online

Command Packet

Byte 0-1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
UT	Value	<00>	<00>	<00>	<00>	<00>

6.1.2.5 CCx (43H 43H x) – Set International Code

The reader can set the different country code and currency code other than 08 40 (US).

Note: This command is valid in the Self-Arm Mode or Arm to Read. For new TLV commands (C8h) shall set in the Terminal Configuration (T01) or Contactless Application Configuration (T15).

Configuration Type

Value	Description
1	Country Code
2	Currency Code

Command Packet

Byte 0-1	Byte 2	Byte 3	Byte 4
CC	Value	<01>	<24>

* “0124” = Canada

6.1.2.6 CT1x (43H 54H 31H x) – Set Transaction Type

The command indicates the type of financial transaction, represented by the first two digits of the ISO 8583:1987 Processing Code. The actual values to be used for the Transaction Type data element are defined by the relevant payment system. The detail value is <00> for Service and Goods.

Note: This command is valid in the Self-Arm Mode or Arm to Read. For new TLV commands (C8h) shall set in the Terminal Configuration (T01) or Contactless Application Configuration (T15).

Command Packet

Byte 0-2	Byte 3
CT1	<00>

* “00” = Service and Goods

6.1.2.7 T01 (54H 30H 31H) – Terminal Configuration Setup

Purpose of command: The EMV application can use this command to send the Terminal Configuration Data to the reader and the maximum buffer size is up to 1K bytes.

Note: user shall set AD0<00> to disable Default AID while using T01.

Command

Byte 1,2,3	Byte 4+n
T01	TLV Data Object List (n bytes)

Required TLV Parameters

Tag	Description	Remarks
9F15	Merchant Category	Optional
9F16	Merchant ID	Optional
9F1A	Terminal Country Code	Optional
9F1C	Terminal ID	Optional
9F1E	IFD Serial NO	Optional
9F35	Terminal Type	Optional
9F4E	Merchant Name and Location	Optional
FFFF8211	Certification Revocation List (Paypass)	Optional
…	…	…

Response

Result	Description
^	Success
*	Bad parameters
!	Can’t execute

1. The reader will reject the command if the data is non-TLV format and invalid coding.
2. For all the unknown tags or tags with incorrect values, it will be ignored by the reader.
3. For the duplicate tags, the reader always overwrites the earlier tag value by the latter tag.
4. The reader accepts partial data update TLV data.

Example:
Terminal Configuration
9F01 06 000000000001 // Acquirer Identifier

9F40 05 6000000001 // Additional Terminal Capabilities
9F3A 04 00000001 // Amount Reference Currency
9F15 02 0001 // Merchant Category Code
9F16 0F 41303030303030303030303030303031 // Merchant Identifier
9F1C 08 3030303030303031 // Terminal Identification
9F1E 08 3030303031323334 // Interface Device (IFD) Serial Number
9F4E 15 5549434E6577205461697065692043697479 2C5457 // Merchant Name and Location

And the data that the host shall send and receive as below,

Host	UIC680
<09><00><60>T01<9F><01><06><00><00><00><00><00><01><9F><40><05><60><00><00><00><01><9F><3A><04><00><00><00><01><9F><15><02><00><01><9F><16><0F><41><30><30><30><30><30><30><30><30><30><30><30><30><30><30><30><31><9F><1C><08><30><30><30><30><30><30><30><30><31><9F><1E><08><30><30><30><30><31><32><33><34><9F><4E><15><55><49><43><4E><65><77><20><54><61><69><70><65><69><20><43><69><74><79><2C><54><57><19>	
	<5E>

6.1.2.8 T03 (54H 30H 33H) – Certificate Authority Public Key Setup

Purpose of command: The EMV application can use this command to send the Certificate Authority Public key data to the secure area in the Reader. The key will be used in the EMV transaction and key number up to 21.

Command

Byte 1,2,3	Byte 4,5,…,13	Byte 14, 15	Byte 16, 17	Byte 18,19,…,57	Byte 58,59	Byte 60,61	Byte 62,63,…, 67	Byte 68+n
T03	RID	PKI	Hash algo	Hash	PK Algo	PK len	PK Exponent	PK Modulus (n bytes)

Parameter description

Parameters	Length	Description
RID	10 bytes	Hexadecimal string (ASCII HEX), the left 5 bytes of EMV Application ID. Example. “A0 00 00 00 03” = 41h 30h 30h 30h 30h 30h 30h 30h 30h 33h
PKI	2 bytes	Public Key Index, hexadecimal string. (Refer to EMV 4.1, tag ‘9F22’) Example, ”92” = 39h 32h
Hash Algo	2 bytes	Hash Algorithm Index, hexadecimal string. ‘01’: SHA-1 is the only acceptable value. Example, “01” = 30h 31h

Hash	40 bytes	SHA 1 checksum of the key (ASCII HEX), SHA-1 hashes calculated over the concatenation of the Modulus
PK Algo	2 bytes	Public Key Algorithm, hexadecimal string. “01”: RSA digital signature is the only acceptable value. Example, “01” = 30h 31h
PK len	2 bytes	Public Key size, hexadecimal string, for example: “B0” = 42h 30h, 176 bytes = 1408 bits
PK Exponent	6 bytes	Public Key Exponent’s size, hexadecimal, “000003”= 30h 30h 30h 30h 30h 33h or “010001” = 30h 31h 30h 30h 30h 32h
PK Modulus	Var. bytes	Public Key Modulus, presented in hexadecimal, data length = 2*[PK length] (ASCII Hex)

Response

Result	Description
^	Success
*	Bad parameters
!	Can’t execute

Example:

Host	UIC680
<09><01>CT03A00000035201017DAF8310B4B0BAD65D51BF4CCB3FFCD1B19F3F1F0180000003A1F5E1C9BD8650BD43AB6EE56B891EF7459C0A24FA84F9127D1A6C79D4930F6DB1852E2510F18B61CD354DB83A356BD190B88AB8DF04284D02A4204A7B6CB7C5551977A9B36379CA3DE1A08E69F301C95CC1C20506959275F41723DD5D2925290579E5A95B0DF6323FC8E9273D6F849198C4996209166D9BFC973C361CC826E1<1D>	
	<5E>

6.1.2.9 T0C (54H 30H 43H) – Configuration Version/Checksum

Purpose of command: To retrieve the checksum/version of the EMV application or the CA public key stored in the reader.

Command

Byte 1,2,3	Byte 4	Byte 5
T0C	Mode	Options

Mode

Parameter	Description

31h	Terminal data checksum request.
32h	EMV Contactless application data checksum request.
33h	Public key data checksum request.

Options

Parameter	Description
AID/(RID+CAPKI) + Transaction Type	To read EMV application data checksum request, user need to enter AID string and Transaction Type. (Ex. A0000000041010<00>)
AID/(RID+CAPKI)	To read Public key data checksum request, user need to input AID String. (Ex: A0000000031010)

Response

Result	Description
20 bytes SHA1 checksum	Only present if the result is successful

Response (Only present if the result is failed)

Result	Description
*	Bad parameters
!	Can't execute

Example:

Host	UIC680
<09><00><04>T0C1<1B>	
	Oz=<80>)<18>o)d2E<FD>b+~<D6>)PL<CD>
<09><00><13>T0C2A0000000031010<00>}	
	<8B><AC><82><0B><AE><9E><15>e<EF>v<F8>L8-n!<20><B2><83><CC>
<09><00><10>T0C3A00000015201{	
	<B0><80>1<BD><A9><C3>)<1A>><8B><9C>y9<15><F2>G<A3><84>k<8F>

6.1.2.10 T15 (54H 31H 35H) – Contactless Application Configuration Setup

Purpose of command: The EMV application can use this command to send one set of EMV application configuration data to the reader. A maximum of up to 1K bytes for one application, T15

command is acceptable by the reader. The total 64 applications can be stored. The command will be rejected if it goes beyond the max number of the application configurations. Please use T1B command to delete the unnecessary application configuration.

Note: user shall set AD0<00> to disable Default AID while using T15.

Command

Byte ,1,2,3	Byte 4+n
T15	Data Object (TLV format) (n bytes)

Required TLV Parameters

Tag	Data Object Name	Format	Length (Byte)
Mandatory Tags			
9F06	Application Identifier (AID) –card	b	5-16
9C	Transaction Type	b	1
Group Tags (Can be sent individually or combined with other tags together)			
9F09	Application Version Number (Paypass M/Chip) (Value = 00 02)	b	2
9F1B	Terminal Floor Limit	b	4
9F1D	Terminal Risk Management Data	b	1
9F33	Terminal Capabilities	b	3
9F40	Additional Terminal Capabilities	b	6
9F66	Terminal Transaction Qualifiers (TTQ)	b	4
9F6D	Application Version Number (Paypass MagStripe) (Value = 00 01)	b	2
DF2A	Threshold Value for Biased Random Selection	b	6
DF2B	Maximum Target Percentage for Biased Random Selection	b	1
DF2C	Target Percentage for Random Selection	b	1
DF810C	Kernel ID	b	1
DF8120	Terminal Action Code - Default	b	5
DF8121	Terminal Action Code - Denial	b	5
DF8122	Terminal Action Code - Online	b	5
DF8123	Reader Contactless Floor Limit	b	6
DF8124	Reader Contactless Transaction Limit - No On-device CVM	b	6
DF8125	Reader Contactless Transaction Limit - On-device CVM	b	6
DF8126	Reader CVM Required Limit	b	6
FFFF8001	Registered Application Provider Identifier (RID)	b	5

Tag	Data Object Name	Format	Length (Byte)
FFFF8002	Application Selection Indicator	n	1
FFFF8004	Disable Contactless Transaction Limit	b	1
FFFF8005	Zero allow	b	1
FFFF8006	CVN17 Enable (VISA)	b	1
FFFF8007	Sign Unit Check (VISA)	b	1
FFFF8008	Amount Option 1/2 Select (VISA)	b	1
FFFF8009	CVM Require Limit Check Enable (VISA)	b	1
FFFF800A	Reader Contactless Floor Limit Check (VISA)	b	1
FFFF800B	Online Capable Disable (VISA)	b	1
FFFF800C	Exception Check Enable	b	1
FFFF800F	Dynamic Reader Limits Enable (VISA)	b	1
FFFF8010	Extended Selection Support flag	b	1
FFFF8013	Pre-Processing Setting	b	1
FFFF8101	Terminal Contactless Floor Limit	n12	6
FFFF8204	Terminal Entry Capability (VISA)	b	1
FFFF8208	Transaction Info	b	1
FFFF8209	Default TDOL	b	n
FFFF820A	Default PDOL	b	n
FFFF820C	Single Unit Value	b	1
FFFF8210	Phone Message Table (Paypass)	b	n
FFFF8211	Certification Revocation List (Paypass)	b	n
…	…		

Response

Result	Description
^	Success
*	Bad parameters
!	Can’t execute

1. Tag 9F 06 (AID) and Transaction Type (9C) are the mandatory tag for each T15 command. UIC680 use AID and Transaction Type to identify the group tags to be stored in the proper location.
2. The reader will reject the command if the data is non-TLV format or with invalid coding.
3. For the unknown tags or tags with incorrect values, it will be ignored by the reader.
4. For the duplicate tags, the reader always overwrites the earlier tag value by the latter tag.
5. The reader accepts the partial data update TLV data.

Example:
VISA AID (A0 00 00 00 03 10 10) with the group of tags
9F06 07 A0000000031010 // AID
9C 01 00 // Transaction Type
FFFF8002 01 01 // ASI
DF810C 01 03 // Kernel ID
FFFF800F 01 00 // Dynamic Reader Limits Enable
FFFF8007 01 00 // Status Check(Signal Unit Enable)
FFFF8005 01 01 // Amount Zero Enable
FFFF8008 01 01 // Amount Zero checking Option 1/2
FFFF8004 01 00 // Disable Contactless Transaction Limit
DF8124 06 000000010000 // Reader Contactless Transaction Limit
FFFF8009 01 01 // CVM Required Limit Check
DF8126 06 000000006000 // CVM Required Limit
FFFF800A 01 01 // Reader Contactless Floor Limit Check
DF8123 06 000000008000 // Reader Contactless Floor Limit
9F1B 00 // Terminal Floor Limit
9F66 04 A6004000 // Terminal Transaction Qualifiers
FFFF8006 01 01 // CVN17 Enable
FFFF800B 01 01 // Online Capable Enable
FFFF800C 01 01 // Exception Check Enable
9F35 01 25 // Terminal Type
9F1A 02 0840 // Country Code
9F33 03 000888 // Terminal Capabilities

And the data that the host shall send and receive as below,

Host	UIC680
<09><00><8e>T15<9f><06><07><a0><00><00><00><03><10><10><9c><01><00><ff><ff><80><02><01><01><df><81><0c><01><03><ff><ff><80><0f><01><00><ff><ff><80><07><01><00><ff><ff><80><05><01><01><ff><ff><80><08><01><01><ff><ff><80><04><01><00><df><81><24><06><00><00><00><01><00><00	

><ff><ff><80><09><01><01><df><81><26><06><00><00><00><00><60><00><ff><ff><80><0a><01><01><df><81><23><06><00><00><00><00><80><00><9f><1b><00><9f><66><04><a6><00><40><00><ff><ff><80><06><01><01><ff><ff><80><0b><01><01><ff><ff><80><0c><01><01><9f><35><01><25><9f><1a><02><08><40><9f><33><03><00><08><88><ce>	
	<5E>

6.1.2.11 T19 (54H 31H 39H) – EMV Contactless Configuration Data Query

Purpose of command: To retrieve the group ID of the EMV application or the CA public key stored in the rerader.

Command

Byte 1,2,3	Byte 4
T19	Configuration Type

Configuration Type

Parameter	Description
31h	Read all the IDs of CA public key, setup by T03.
32h	Read all the sets of AID + Transaction Type of EMV application data, setup by T15.
33h + AID + Transaction Type	Read data setting of AID and Transaction Type. (Ex: A00000031010<00>)
34h	Read data of terminal

Response

Result	Description
ID List	The concatenation of IDs. There is a <1C> between each ID. Only present if the result is successful

Response (Only present if the result is failed)

Result	Description
*	Bad parameters
!	Can't execute

Example:

Host	UIC680

<09><00><04>T191`	
	A00000015201<1C>A00000015203
<09><00><04>T192c	
	A0000000031010<00><1C>A0000000999090<00><1C>A0000000032010<00><1C>A0000000041010<00><1C>A0000000043060<00><1C>B012345678<00><1C>A00000002501<00><1C>A0000003241010<00><1C>A0000001523010<00>
<09><00><13>T193A0000000031010<00><07>	
	<9F><06><07><A0><00><00><00><03><10><10><9C><01><00><FF><FF><80><02><01><01><FF><FF><80><03><01><03><FF><FF><80><04><01><01><FF><FF><80><05><01><01><9F><1B><04><00><00>'<10><FF><FF><81><01><06><00><00><00><10><00><00><FF><FF><81><02><06><00><00><00>P<00><00><FF><FF><81><03><06><00><00><00><20><00><00><9F><09><02><00><02><9F>3<03><00><08><88><9F>f<04><A0><00><00><00><9F><1A><02><08>@<FF><FF><80><06><01><01><FF><FF><80><07><01><01><FF><FF><80><08><01><00><FF><FF><80><09><01><00><FF><FF><80><0A><01><01><FF><FF><80><0B><01><00><9F>5<01>%
<09><00><04>T194e	
	<9F><15><08>00000000<9F><16><0F>0000000000000001<9F><1A><02><08>@<9F><1C><08>00000000<9F><1E><08>00000000<9F>5<01><00>

6.1.2.12 T1B (54H 31H 42H) – Delete EMV Contactless Configuration Data

Purpose of command: To delete the EMV application or the CA public key stored in the reader.

Command

Byte 1,2,3	Byte 4	Byte 5	Byte 6+n
T1B	Configuration Type	<1A> (Optional)	AID List * (n bytes) (Optional)

*The concatenation of IDs. There is a <1C> between each ID.

Configuration Type

Parameter	Description
31h	Delete the CA public key associated with the ID (loaded by T03). The following parameters will be needed: <1A>, ID and the ID separator <1C>

32h	Delete the application data associated with the ID (loaded by T15). The following parameters will be needed: <1A>, ID and the ID separator <1C>
33h	Delete all CA public keys.
34h	Delete all EMV application data.
35h	Delete Terminal Setting.
36h	Reserved
37h	Reserved

Response

Result	Description
^	Success
*	Bad parameters
!	Can't execute

Example:

Assuming there is a key ID = A00000000392

Host	UIC680
<09><00><04>T191`	
	A00000000392

Delete key ID A00000000392

Host	UIC680
<09><00><12>T1B1<1A>A00000000392<1C>r	
	^

Assuming there are two application files - A0000000031010 and A0000000041010

Host	UIC680
<09><00><04>T192c	
	A0000000031010<1C>A0000000041010

Delete 2 applications files

Host	UIC680
<09><00>#T1B2<1A>A0000000031010<1C>A0000000041010<1C>"	
	^

6.1.2.13 T1C (54H 31H 43H) – Terminal and Application List Default Setting

Purpose of command: Restore the default terminal and application data in the reader.

Command

Byte 1,2,3
T1C

Response

Result	Description
^	Success
*	Bad parameters
!	Can't execute

Note 1: This command will take 15 – 20 seconds to update EEPROM.
Note 2: Be careful to use this command because the previous data will be changed permanently.

6.1.2.14 AAx – Enable/Disable New TLV commands

Purpose of command: To enable/disable the new TLV commands (C8h, C9h, CEh), If the reader set to disable, the behavior of the reader is compatible to the previous version.

x	Command Form (Hex)	Description
'E' (45h)	09h 00h 03h 41h 41h 45h 4Fh	Enable
'D' (44h)	09h 00h 03h 41h 41h 44h 4Eh	Disable (default)

6.1.2.15 TKx (54H 4BH x) – Set Transmitting Data Tracks

Purpose of command: To select the different tracks data output

Command

x is an ASCII number ('1' - '7').

x	Command Form (Hex)	Transmit Track(s)
'1' (31h)	09h 00h 03h 54h 4Bh 31h 24h	Track 1

'2' (32h)	09h 00h 03h 54h 4Bh 32h 27h	Track 2
'3' (33h)	09h 00h 03h 54h 4Bh 33h 26h	Track 1 & 2
'4' (34h)	09h 00h 03h 54h 4Bh 34h 21h	Track 3
'5' (35h)	09h 00h 03h 54h 4Bh 35h 20h	Track 1 & 3
'6' (36h)	09h 00h 03h 54h 4Bh 36h 23h	Track 2 & 3
'7' (37h)	09h 00h 03h 54h 4Bh 37h 22h	Track 1, 2 & 3(default)

Example:

Only enable track 1 & 2

Host	UIC680
<09><00><03>TK3&	
	^

6.1.2.16 M5xx (4DH 35H xxH xxH) – Mifare Type Detection Option

When MIFARE Auto-Polling is enabled, this command can be used to define which Mifare card types will be detected by the reader.

Command format

Byte 0~1 (2 bytes)	Byte 2~3 (2 bytes)
M5	Card Type

Card type to be detected

Byte 0		Byte 1	
Bit 0	MIFARE Ultralight	Bit 0	JCOP31
Bit 1	MIFARE 1K	Bit 1	Reserved
Bit 2	MIFARE 4k	Bit 2	Reserved
Bit 3	MIFARE DESFire	Bit 3	Reserved
Bit 4	MIFARE Plus 2K	Bit 4	Reserved
Bit 5	MIFARE Mini	Bit 5	Reserved
Bit 6	MPCOS Gemplus	Bit 6	Reserved
Bit 7	Jewel for Innovision	Bit 7	Reserved

Note: A value of 0 (or 1) means disabling (or enabling) the detection of the corresponding type of Mifare card.

Response

Message	Meaning
^	Successful
*	Bad parameters
!	Can’t execute

6.2. EMV Mode Enable/Disable Arrangements

The EMV mode operation of the individual card brands can be enabled or disabled according to the following arrangements:

1. MasterCard

a) Magstripe only: send the BLP command **CP<00>**
b) MChip enabled: send the BLP command **CP<01>**

2. Visa

Determined by the TTQ setting

Byte	Bit	Definition
1	8	**1b = MSD supported**
	7	RFU (0b) Note: Contactless VSDC is no longer supported in [VCPS].
	6	**1b = qVSDC supported**
	5	1b = EMV contact chip supported
	4	1b = Offline-only reader
	3	1b = Online PIN supported
	2	1b = Signature supported
	1	1b = Offline Data Authentication (ODA) for Online Authorizations supported Note: Readers compliant to [VCPS] set this bit to 0b
2	8	1b = Online cryptogram required
	7	1b = CVM required
	6	1b = (Contact Chip) Offline PIN supported
	5-1	RFU (00000b)
3	8	1b = Issuer Update Processing supported
	7	1b = Mobile functionality supported (Consumer Device CVM)
	6-1	RFU (000000b)
4	8-1	RFU (000000b)

Note: This column is for reference only; please refer to “Visa Contactless Payment Specification - Reader Implementation Notes Version 1.1, October 2009” for more details.

3. DPAS

Determined by the TTQ setting

Byte	Bit	Definition
1	8	**1b = Mag stripe mode supported**

	7	RFU (0b)
	6	**1b = EMV mode supported**
	5	1b = EMV contact chip supported
	4	1b = Offline-only reader
	3	1b = Online PIN supported
	2	1b = Signature supported
	1	RFU (0b) Note: Readers compliant to [EMV CTL: BOOK B, v2.1] must set TTQ B1b1 to '0'.
2	8	1b = Online cryptogram required This bit is set dynamically based on pre-processing result.
	7	1b = CVM required This bit is set dynamically based on pre-processing result.
	6	1b = (Contact Chip) Offline PIN supported This bit shall be set to '1' if the Terminal has a contact interface. Otherwise, it shall be set to '0' if the Terminal is a contactless only Terminal.
	5-1	RFU (00000b)
3	8	1b = Issuer Update Processing supported
	7	1b = Consumer Device CVM
	6-1	RFU (000000b)
4	8-1	RFU (000000b)

Note: This column is for reference only; please refer to "Discover® Contactless D-PAS: Card Application Specification" for more details.

4. American Express

Determined by the tag 9F6D setting

B8	B7	B6	B5	B4	B3	B2	B1	Meaning
0	0			0				Expresspay 1.0
0	1			0				Expresspay 2.0 – Magstripe Only
1	1			0				Expresspay 2.0 – EMV and Magstripe
1	1			x				Expresspay Mobile – EMV supported

Note: This column is for reference only; please refer to "Expresspay Terminal Specification 3.0, February 2012" for more details.

7. Appendix A Default Terminal and Application Data

7.1. Terminal

```
9F1E 08 3030303030303031                    // Interface Device (IFD) Serial Number
9F16 0F 303030303030303030303030303031      // Merchant Identifier
9F4E 08 3030303030303031                    // Merchant Name and Location
DF811C 02 0000                              // Max Lifetime of Torn Transaction Log Record
DF811D 01 00                                // Max Number of Torn Transaction Log Records
9F1A 02 0056                                // Terminal Country Code
9F1C 08 3030303030303031                    // Terminal Identification
FFFF8211 81C4
A0000000045CF85A000010000011000101000110000111001000001001001010001011001100001101001110001111010000010001010010
010011010100010101010111011000011001011010011011011100011101011110011111100000100001B0123456785CF85A000010000011
000101000110000111001000001001001010001011001100001101001110001111010000010001010010010011010100010101010111011 0
000110010110100110110111000111010111100111111100000100001    // Certification Revocation List
```

Note:
Please check Appendix B for the detail data field of Certification Revocation List.

7.2. Application List

7.2.1. VISA – A0 00 00 00 03 10 10 (Credit)

```
9F06 07 A0000000031010  // AID
9C 01 00                // Transaction Type
FFFF8002 01 01          // ASI
DF810C 01 03            // Kernel ID
FFFF800F 01 00          // Dynamic Reader Limits Enable
FFFF8007 01 00          // Status Check(Signal Unit Enable)
FFFF8005 01 01          // Amount Zero Enable
FFFF8008 01 01          // Amount Zero checking Option 1⁄2
FFFF8004 01 00          // Disable Contactless Transaction Limit
DF8124 06 000000010000  // Reader Contactless Transaction Limit
FFFF8009 01 01          // CVM Required Limit Check
DF8126 06 000000006000  // CVM Required Limit
FFFF800A 01 01          // Reader Contactless Floor Limit Check
DF8123 06 000000008000  // Reader Contactless Floor Limit
9F1B 00                 // Terminal Floor Limit
9F66 04 A6004000        // Terminal Transaction Qualifiers
FFFF8006 01 01          // CVN17 Enable
FFFF800B 01 01          // Online Capable Enable
FFFF800C 01 01          // Exception Check Enable
```

```
9F35 01 25              // Terminal Type
9F1A 02 0840            // Country Code
9F33 03 000888          // Terminal Capabilities
```

7.2.2. VISA – A0 00 00 00 03 20 10 (Electron)

```
9F06 07 A0000000032010  // AID
9C 01 00                // Transaction Type
FFFF8002 01 01          // ASI
DF810C 01 03            // Kernel ID
FFFF800F 01 00          // Dynamic Reader Limits Enable
FFFF8007 01 00          // Status Check(Signal Unit Enable)
FFFF8005 01 01          // Amount Zero Enable
FFFF8008 01 01          // Amount Zero checking Option 1/2
FFFF8004 01 00          // Disable Contactless Transaction Limit
DF8124 06 000000010000  // Reader Contactless Transaction Limit
FFFF8009 01 01          // CVM Required Limit Check
DF8126 06 000000006000  // CVM Required Limit
FFFF800A 01 01          // Reader Contactless Floor Limit Check
DF8123 06 000000008000  // Reader Contactless Floor Limit
9F1B 00                 // Terminal Floor Limit
9F66 04 A6004000        // Terminal Transaction Qualifiers
FFFF8006 01 01          // CVN17 Enable
FFFF800B 01 01          // Online Capable Enable
FFFF800C 01 01          // Exception Check Enable
9F35 01 25              // Terminal Type
9F1A 02 0840            // Country Code
9F33 03 000888          // Terminal Capabilities
```

7.2.3. PayPass – A0 00 00 00 04 10 10 (Credit)

```
9F06 07 A0000000041010  // AID_MasterCard
9C 01 00                // Transaction Type
FFFF8002 01 01          // Application Selection Identifier
FFFF8004 01 01          // Disable Contactless Transaction Limit
FFFF8005 01 01          // Zero allow
FFFF8007 01 01          // Sign Unit Check
FFFF8009 01 01          // CVM Require Limit Check Enable
FFFF8010 01 00          // Extended Selection Support flag
FFFF8208 01 40          // Transaction Info
5F57 00                 // Account Type
9F01 00                 // Acquirer Identifier
9F40 05 0000000000      // Additional Terminal Capabilities
9F09 02 0002            // App Version
DF8117 01 00            // Card Data Input Capability
DF8118 01 60            // CVM Capability-CVM Required
DF8119 01 08            // CVM Capability-No CVM Required
DF811A 03 9F6A04        // Default UDOL
DF8130 00               // Hold Time Value
DF811B 01 20            // Kernel Configuration
DF810C 01 02            // Kernekl ID
9F6D 02 0001            // Mag-stripe Application Version Number
DF811E 01 10            // Mag-stripe CVM Capability-CVM Required
```

```
DF812C 01 00              // Mag-stripe CVM Capability-No CVM Required
9F15 02 0001              // Merchant Category Code
DF812D 03 000000          // Message Hold Time
9F7E 00                   // Mobile Support Indicator
DF8123 06 000000010000    // Reader Contactless Floor Limit
DF8124 06 000000030000    // Reader CTL (No On-device CVM)
DF8125 06 000000050000    // Reader CTL (On-device CVM)
DF8126 06 000000001000    // CVM Required Limit
DF811F 01 08              // Security Capability (CDA)
DF8120 05 0000000000      // Terminal Action Code-Default
DF8121 05 0000000000      // Terminal Action Code-Denial
DF8122 05 0000000000      // Terminal Action Code-Online
9F33 00                   // Terminal Capabilities
9F35 01 22                // Terminal Type
FFFF8026 01 01            // Transaction Type Check
5F36 01 02                // Transaction Currency Exponent
```

7.2.4. PayPass – A0 00 00 00 04 30 60 (Maestro)

```
9F06 07 A0000000043060    // AID_MaestroCard
9C 01 00                  // Transaction Type
FFFF8002 01 01            // Application Selection Identifier
FFFF8004 01 01            // Disable Contactless Transaction Limit
FFFF8005 01 01            // Zero allow
FFFF8007 01 01            // Sign Unit Check
FFFF8009 01 01            // CVM Require Limit Check Enable
FFFF8010 01 00            // Extended Selection Support flag
FFFF8208 01 40            // Transaction Info
5F57 00                   // Account Type
9F01 00                   // Acquirer Identifier
9F40 05 0000000000        // Additional Terminal Capabilities
9F09 02 0002              // App Version
DF8117 01 00              // Card Data Input Capability
DF8118 01 60              // CVM Capability-CVM Required
DF8119 01 08              // CVM Capability-No CVM Required
DF811A 03 9F6A04          // Default UDOL
DF8130 01 00              // Hold Time Value
DF811B 01 A0              // Kernel Configuration
DF810C 01 02              // Kernekl ID
9F6D 02 0001              // Mag-stripe Application Version Number
DF811E 01 10              // Mag-stripe CVM Capability–CVM Required
DF812C 01 00              // Mag-stripe CVM Capability–No CVM Required
9F15 02 0001              // Merchant Category Code
DF812D 03 000000          // Message Hold Time
9F7E 00                   // Mobile Support Indicator
DF8123 06 000000010000    // Reader Contactless Floor Limit
DF8124 06 000000030000    // Reader CTL (No On-device CVM)
DF8125 06 000000050000    // Reader CTL (On-device CVM)
DF8126 06 000000030000    // CVM Required Limit
DF811F 01 08              // Security Capability
DF8120 05 0000000000      // Terminal Action Code-Default
DF8121 05 0000000000      // Terminal Action Code-Denial
DF8122 05 0000000000      // Terminal Action Code-Online
9F33 00                   // Terminal Capabilities
9F35 01 22                // Terminal Type
FFFF8026 01 01            // Transaction Type Check
```

```
5F36 01 02          // Transaction Currency Exponent
```

7.2.5. AMEX – A0 00 00 00 25 01

```
9F06 06 A00000002501  // AID
9C 01 00              // Transaction Type
FFFF8002 01 03        // Application Selection Identifier
DF810C 01 04          // Kernel ID
9F6D 01 C0            // Terminal Capabilities
9F6E 04 58E00000      // Terminal Transaction Capabilities
FFFF8004 01 00        // Disable Contactless Transaction Limit
FFFF8005 01 01        // Zero allow
FFFF8007 01 01        // Sign Unit Check
FFFF8009 01 01        // CVM Require Limit Check Enable
FFFF8010 01 00        // Extended Selection Support flag
FFFF8208 01 40        // Transaction Info
9F40 05 6000000001    // Additional Terminal Capabilities
9F09 02 0001          // Application Version Number
9F33 03 00F888        // Terminal Capabilities
9F35 01 22            // Terminal Type
DF8123 06 000000010000 // Reader Contactless Floor Limit
DF8124 06 000000015000 // Reader Contactless Transaction Limit
DF8126 06 000000005000 // CVM Required Limit
9F1B 04 00010000      // Reader Floor Limit
9F1A 02 0620          // Country Code
DF2A 06 000000000500  // Threshold Value for Biased Random Selection
DF2B 01 63            // Maximum Target Percentage for Biased Random Selection
DF2C 01 00            // Target Percentage for Random Selection
DF8120 05 0000000000  // Terminal Action Code (Default)
DF8121 05 0000000000  // Terminal Action Code (Denial)
DF8122 05 0000000000  // Terminal Action Code (Online)
5F2A 02 0978          // Currency Code
FFFF8013 01 01        // Pre-Processing Setting
```

7.2.6. Discover – A0 00 00 03 24 10 10 (ZIP)

```
9F06 07 A0000003241010  // AID_ZIPCard
9C 01 00                // Transaction Type
FFFF8002 01 01          // Application Selection Identifier
DF810C 01 05            // Kernel ID
FFFF8004 01 01          // Disable Contactless Transaction Limit
FFFF8005 01 01          // Zero allow
FFFF8007 01 01          // Sign Unit Check
FFFF820C 01 01          // Sign Unit Value
FFFF8009 01 01          // CVM Require Limit Check Enable
FFFF8010 01 01          // Extended Selection Support flag
FFFF8208 01 40          // Transaction Info
9F40 05 6000000001      // Additional Terminal Capabilities
9F09 02 0100            // App Version
9F33 03 E0E808          // Terminal Capabilities
9F35 01 25              // Terminal Type
FFFF800A 01 01          // Reader Contactless Floor Limit Check
9F1B 04 00003A98        // Terminal Floor Limit
```

DF8123 06 000000015000 // Reader Contactless Floor Limit
DF8124 06 000000030000 // Reader CTL (No On-device CVM)
DF8126 06 000000000500 // CVM Required Limit
9F66 04 A6004000 // TTQ
FFFF8206 01 03 // Retry Counter for Online Response
FFFF8207 04 00008000 // Time Out for Online Response
FFFF8010 01 01 // TAG_EXTENDED_SELECTION_CHECK

7.2.7. Discover – A0 00 00 01 52 30 10 (DPAS)

9F06 07 A0000001523010 // AID_DPASCard
9C 01 00 // Transaction Type
FFFF8002 01 01 // Application Selection Identifier
DF810C 01 05 // Kernel ID
FFFF8004 01 01 // Disable Contactless Transaction Limit
FFFF8005 01 01 // Zero allow
FFFF8007 01 01 // Sign Unit Check
FFFF820C 01 01 // Sign Unit Value
FFFF8009 01 01 // CVM Require Limit Check Enable
FFFF8010 01 01 // Extended Selection Support flag
FFFF8208 01 40 // Transaction Info
9F40 05 6000000001 // Additional Terminal Capabilities
9F09 02 0100 // App Version
9F33 03 E0E808 // Terminal Capabilities
9F35 01 25 // Terminal Type
FFFF800A 01 01 // Reader Contactless Floor Limit Check
9F1B 04 00003A98 // Terminal Floor Limit
DF8123 06 000000015000 // Reader Contactless Floor Limit
DF8124 06 000000030000 // Reader CTL (No On-device CVM)
DF8126 06 000000000500 // CVM Required Limit
9F66 04 A6004000 // TTQ
FFFF8206 01 03 // Retry Counter for Online Response
FFFF8207 04 00008000 // Time Out for Online Response

8. Appendix B Private Tag Definition

● Common Usage

1. Extended Selection Support flag, 0xFFFF8010

Parameter	Description
01h	Extended Selection supported *1

Example

FFFF8010 01 01

***1: Extended Selection: An option in which Entry Point appends the value indicated by the Extended Selection data element (Tag '9F29') to the ADF name in the SELECT command.**

2. Pre-Processing Setting, 0xFFFF8013.

Bit	Definition
8 ~ 2	RFU
1	1b = End in the "Pre-Processing" step supported *1

Example

FFFF8013 01 01

***1: If at the end of "Pre-Processing" step no application is on the list, the Terminal shall not continue with the contactless interface and only accept payment over an alternative interface.**

● Kernel - Paypass

1. Certification Revocation List data

RID: A0 00 00 00 04 CA PK Index: F8 Certificate Serial Number:	RID: B0 12 34 56 78 CA PK Index: F8 Certificate Serial Number:
00 00 10	00 00 10
00 00 11	00 00 11
00 01 01	00 01 01
00 01 10	00 01 10
00 01 11	00 01 11
00 10 00	00 10 00
00 10 01	00 10 01
00 10 10	00 10 10
00 10 11	00 10 11
00 11 00	00 11 00
00 11 01	00 11 01
00 11 10	00 11 10
00 11 11	00 11 11
01 00 00	01 00 00
01 00 01	01 00 01
01 00 10	01 00 10
01 00 11	01 00 11
01 01 00	01 01 00
01 01 01	01 01 01
01 01 11	01 01 11
01 10 00	01 10 00
01 10 01	01 10 01
01 10 10	01 10 10
01 10 11	01 10 11
01 11 00	01 11 00
01 11 01	01 11 01
01 11 10	01 11 10
01 11 11	01 11 11
10 00 00	10 00 00
10 00 01	10 00 01

The format of Private Tag, Certification Revocation List (0xFFFF8211), is set as below,

FFFF8211 81C4
A0000000045CF85A00001000001100010100011000011100100000100100101000101100110000110100111000111101000001000101001001001101010001010101011101100001100101101001101101110001110101111001111110000010000 1B0123456785CF85A000010000011000101000111000011100100000100100101000101100110000111010011100011110100000100010100100100110101000101010101110110000110010111010011011011100011101011110011111110000010000 1

2. Default Setting in Phone Message Table

ID	PCII MASK			PCII VALUE			MESSAGE	STATUS
1	00	08	00	00	08	00	20 (SEE PHONE)*	00 (NOT READY) *
2	00	04	00	00	04	00	20 (SEE PHONE) *	00 (NOT READY) *
3	00	01	00	00	01	00	20 (SEE PHONE) *	00 (NOT READY) *
4	00	02	00	00	02	00	20 (SEE PHONE) *	00 (NOT READY) *
5	00	00	00	00	00	00	07 (DECLINED) *	00 (NOT READY) *

Note: defined in the tag of User Interface Request Data, 0xDF8116

The format of Private Tag, Phone Message Table (0xFFFF8210), is set as below,

FFFF8210 32 0008000008002000000400000400200000010000010020000002000002002000000000000000700

3. The Private Tags of Signal Out, 0xFFFF8212, and Message Out, 0xFFFF8213

In Paypass 3.0, it defined two special signals called OUT Signal and MSG Signal. The OUT Signal indicates the outcome of the transaction. It contains a subset of Outcome from the kernel. The MSG Signal is used as a carrier of the User Interface Request Data.

In order to meet the performance requirement and more convenient for user to access, UIC defines two private tags for user to get and parse after transaction. Both of Tags are built as TLV format. But the Length in Data field is non-TLV and fixed as 2 bytes. For each pair of Length + Data, it presents the transaction result in turn.

Tag	Name	Length	Data Field
FFFF8212	Signal Out	n bytes (TLV format)	[Length (2bytes) + Data] * n
FFFF8213	Message Out	n bytes (TLV format)	[Length (2bytes) + Data] * n

Example

Msg Out:
Send: <CE>FFFF8213x
Receive:
003DFFFF8213**38001A**DF8116161E040000000000000000000000000000000000000000**001A**DF8116161B000000000000000000000000000000000000000000000000

The result can be parsed as below,

Index.01

---User Interface Request Data---
DF8116=1E040000000000000000000000000000000000000000
****
Msg ID = Clear Display
Status = Card Read Successfully
Hold Time = 000000
Language Preference = 0000000000000000
Value Qualifier = None
Value = 000000000000
Currency Code = 0000

Index.02

---User Interface Request Data---
DF8116=1B000000000000000000000000000000000000000000
****
Msg ID = Authorising-Please Wait
Status = Not Ready
Hold Time = 000000
Language Preference = 0000000000000000
Value Qualifier = None
Value = 000000000000
Currency Code = 0000

Signal Out:
Send: <CE>FFFF8212x
Receive:
00DEFFFF8212**81D8**00D6DF81290830F0F00038F0FF00FF81060F9F42020978DF8115060000000000FFFF810581B29F02
060000000002009F26080344EA4C7241FAA35F2403091231820258805 00A4D617374657243617264 5A0854133300896
010755F3401009F360216609F090200029F2701809F34035F03028407A00000000410109F1E0830303030303030319F1
0120110A000092280000000000000000000003FF9F33030008089F1A0200569F3501229505804000000057115413330089601075D09122010123401842 5F2A0208409A031404019C01009F37043881283F

The result can be parsed as below,

Index.01

---Outcome Parameter Set---
DF8129=30F0F00038F0FF00
****
Status = ONLINE REQUEST
Start = N/A
Online Response Data = N/A
CVM = NO CVM
UI Request On Outcome Present = Not Set
UI Request On Restart Present = Not Set
Data Record Present = Set
Discretionary Data Present = Set

Receipt = Yes
Alternate Interface Preference = N/A
Field Off Request = N/A
Remove Timeout = 00
---Discretionary Data---
FF8106=9F42020978DF8115060000000000FF
****
9F42 = 0978
---Error Indication---
DF8115=0000000000FF
****
L1=OK
L2=OK
L3=OK
SW12=0000
MsgOnErr=N/A
---Data Record---
FF8105=9F02060000000002009F26080344EA4C7241FAA35F2403091231820258805 00A4D617374657243617264 5A08
5413330089601075 5F3401009F360216609F090200029F2701809F34035F03028407A00000000410109F1E0830303030
303030319F10120110A0000922800000000000000000000003FF9F33030008089F1A0200569F3501229505804000000057
11541333008960107 5D09122010123401842 5F2A0208409A031404019C01009F37043881283F
****
9F02 = 000000000200
9F26 = 0344EA4C7241FAA3
5F24 = 091231
82 = 5880
50 = 4D617374657243617264
5A = 5413330089601075
5F34 = 00
9F36 = 1660
9F09 = 0002
9F27 = 80
9F34 = 5F0302
84 = A0000000041010
9F1E = 3030303030303031
9F10 = 0110A0000922800000000000000000000003FF
9F33 = 000808
9F1A = 0056
9F35 = 22
95 = 8040000000
57 = 5413330089601075D09122010123401842
5F2A = 0840
9A = 140401
9C = 00
9F37 = 3881283F

9. Appendix C Examples

The example is to demonstrate how to load the data to UIC680 to perform the transaction. All of the data can COPY-N-PASTE to the DirectIO window of UIC680 DEMO application to send to UIC680. Please note: the DirectIO will add the header and the trailer to the command. The user only just copies the command described in the example to the input field and select the protocol such as BLP or USI1. Then click the send button)

9.1. Enable TLV Commands

Note: This command is necessary if TLV commands are not enable

Host	UIC680
<09><00><03>AAEO	
	^

9.2. Configure Track Output (only need track 1 &2)

Host	UIC680
<09><00><03>TK3&	
	^

9.3. Set Terminal Data

Note: No need to send this command if the default value is used (the data list here is reference only)

```
<9F><15><02><00><01>              // Merchant Category
<9F><16><0F>123456789012345  // Merchant ID
<9F><1A><02><08><40>              // Terminal Country Code
<9F><1C><08>00000000                    // Terminal ID
<9F><1E><08>00000000                          // IFD Serial NO
<9F><40><05><60><00><00><00><01>          // Additional Terminal Capabilities
```

Host	UIC680

<09><00>=T01<9F><15><02><00><01><9F><16><0F>123456789012345<9F><1A><02><08>@<9F><1C><08>00000000<9F><1E><08>00000000<9F>@<05>`<00><00><00><01>(	
	^

9.4. Set Application List

Note: No need to send this command if the default value is used (the data list here is reference only)

VISA 9F06 07 A0000000031010 // AID 9C 01 00 // Transaction Type FFFF8002 01 01 // ASI DF810C 01 03 // Kernel ID FFFF800F 01 00 // Dynamic Reader Limits Enable FFFF8007 01 00 // Status Check(Signal Unit Enable) FFFF8005 01 01 // Amount Zero Enable FFFF8008 01 01 // Amount Zero checking Option 1/2 FFFF8004 01 00 // Disable Contactless Transaction Limit DF8124 06 000000010000 // Reader Contactless Transaction Limit FFFF8009 01 01 // CVM Required Limit Check DF8126 06 000000006000 // CVM Required Limit FFFF800A 01 01 // Reader Contactless Floor Limit Check DF8123 06 000000008000 // Reader Contactless Floor Limit 9F1B 00 // Terminal Floor Limit 9F66 04 A6004000 // Terminal Transaction Qualifiers FFFF8006 01 01 // CVN17 Enable FFFF800B 01 01 // Online Capable Enable FFFF800C 01 01 // Exception Check Enable 9F35 01 25 // Terminal Type 9F1A 02 0840 // Country Code 9F33 03 000888 // Terminal Capabilities

Host	UIC680
<09><00><8e>T15<9f><06><07><a0><00><00><00><03><10><10><9c><01><00><ff><ff><80><02><01><01><df><81><0c><01><03><ff><ff><80><0f><01><00><ff><ff><80><07><01><00><ff><ff><80><05><01><01><ff><ff><80><08><01><01><ff><ff><80><04><01><00><df><81><24><06><00><00><00><01><00><00><ff><ff><80><09><01><01><df><81><26><06><00><00><00><00><60><00><ff><ff><80><0a><01><01><df><81><23><06><00><00><00><00><80><00><9f><1b><00><9f><66><04><a6><00><40><00><ff><ff><80><06><01><01><ff><ff><80><0b><01><01><ff><ff><80><0c><01><01><9f><35><01><25><9f><1a><02><08><40><9f><33><03><00><08><88><ce>	
	^

9.5. Load User Public Key (VISA public key, 1408 bit)

Host	UIC680
<09><01><A3>T03A0000000039201429C954A3859CEF91295F663C963E582ED6EB25301B0000003996AF56F569187D09293C14810450ED8EE3357397B18A2458EFAA92DA3B6DF6514EC060195318FD43BE9B8F0CC669E3F844057CBDDF8BDA191BB64473BC8DC9A730DB8F6B4EDE3924186FFD9B8C7735789C23A36BA0B8AF65372EB57EA5D89E7D14E9C7B6B557460F10885DA16AC923F15AF3758F0F03EBD3C5C2C949CBA306DB44E6A2C076C5F67E281D7EF56785DC4D75945E491F01918800A9E2DC66F60080566CE0DAF8D17EAD46AD8E30A247C9F<FD>	
	^

9.6. Enable User CA Key

Host	UIC680
<09><00><03>CK<00><02>	
	^

9.7. Start Transaction

Host	UIC680
<C8><01><9F><02><06><00><00><00><00><02><00><9C><01><00>	
	^

9.8. Read Card (tap the card, VISA CDET card number 2)

Host	UIC680

Host	UIC680
n/a	
	<C9><01><01>%B4761739001010010^ /^1312201938114030000?;4761739001010010=131220111438039?

Return code: offline approval
Card: Contactless – qVSDC Card

9.9. Retrieve EMV tags if necessary

Host	UIC680
<CE>9F36x9F26x9F10x57x9F4Bx9F6Cx	
	<00><B4><9F>6<02><00><02><9F>&<08><BF><F1><F4><BB><9E>9 <1D>7<9F><10><07><06><01><11><03><90><00><00>W<10>Gas< 90><01><01><00><10><D1>1"<01><11>C<80>9<9F>K<80>c6U=<D 8>_K<7F>a<87>-<E6>$<AB>VH<C3>F<D8><A4><C1>$<00>}J<F5>o< 9F><85><1A><C1><C0>b<96><02><1D>Ve<98><ED>kp<86><A8><9 8>e<9B><8C>D]I<C1>J$<9A><07>sj<1A><FA><93><86><86><FB>(< 0C><BD>`6|<EB>L<B7><04><A2><D5><CA><99>T(<F3><95>#<F9>< 91>i<A6><A0><F3><FE><F1><D8><ED><EE><DD>x<B5><D2><85>< 9A><E7><C8><C8><F1><93>O5<04><82><0F><92>y<E6>x1<AF><FE >.I<B8><F5><82>r<1B><CF>Qz<EF><9F>l<02>0<00>

Tag 9F 36: 00 02
Tag 9F 26: BF F1 F4 BB 9E 39 1D 37
Tag 9F 10: 06 01 11 03 90 00 00
Tag 57: 47 61 73 90 01 01 00 10 D1 31 22 01 11 43 80 39
Tag 9F 4B: 63 36 55 3D D8 5F 4B 7F 61 87 2D E6 24 AB 56 48 C3 46 D8 A4 C1 24 00 7D 4A F5 6F 9F 85 1A C1 C0 62 96 02 1D 56 65 98 ED 6B 70 86 A8 98 65 9B 8C 44 5D 49 C1 4A 24 9A 07 73 6A 1A FA 93 86 86 FB 28 0C BD 60 36 7C EB 4C B7 04 A2 D5 CA 99 54 28 F3 95 23 F9 91 69 A6 A0 F3 FE F1 D8 ED EE DD 78 B5 D2 85 9A E7 C8 C8 F1 93 4F 35 04 82 0F 92 79 E6 78 31 AF FE 2E 49 B8 F5 82 72 1B CF 51 7A EF
Tag 9F 6C: 30 00

Go back to Step 6, if the application is ready to accept next transaction.