

	SPECIFICATION	Model No.	CRT-288-K001
		Date	2013/11/19
	DLL	Ver.	V1.0
		Page	1/15

•Windows DLL Specification

Provide Windows32 DLL on windows environment platform, files' names as following:

1. CRT_288_K001.H 32 digit dynamic library header file
2. CRT_288_K001.LIB 32 digit input dynamic library
3. CRT_288_K001.DLL Windows32 DLL file

•Applicable Card Type

1. RF Card: ISO/IEC 14443 TYPE A / B, MIFARE one (S50, S70, UL)
2. Contact IC Card:
 - SLE4428, SLE4442
 - 24C01A, 24C02, 24C04, 24C08, 24C16, 24C32, 24C64
 - Contact CPU Card (T=0/T=1)
 - SAM/SIM Card (T=0/T=1)
3. Magnetic card (Read only)

	SPECIFICATION	Model No.	CRT-288K001
		Date	2013/11/19
	DLL	Ver.	V1.0
		Page	2/15

CONTENTS

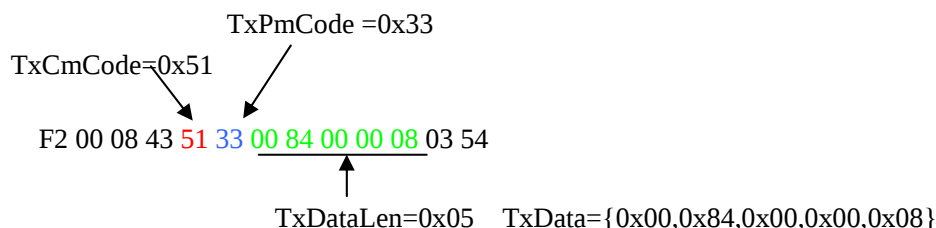
1. Combination of Function Parameter	3
1.1 Function Parameter Specification According to Communication Protocol.....	3
2. API Reference Instruction (RS-232 Interface)	4
2.1 Function for Open Com Port (Default Baud rate: 38400bps).....	4
2.2 Function for Open Com Port by Specified Baud Rate	5
2.3 Function For Close Com Port.....	6
2.4 Function for Execution of Command	7
2.5 Function for Active upload Magnetic stripe card data.....	7
2.6 Function for cancelling insertion or pulling out the card	8
3 API Reference Instruction2 (USB Interface).....	9
3.1 Function for Open USB.....	9
3.2 Function For Close of USB Interface.....	10
3.3 Function For Open Multiple USB Interface	11
3.4 Function For Close Multiple USB Device	12
3.5 Function For Command Execution.....	13
3.6 Function for Active upload Magnetic stripe card data.....	13
3.7 Function for cancelling insertion or pulling out the card	14
4. API Calling Instruction.....	15
4.1 API Calling Instruction.....	15

	SPECIFICATION	Model No.	CRT-288K001
		Date	2013/11/19
	DLL	Ver.	V1.0
		Page	3/15

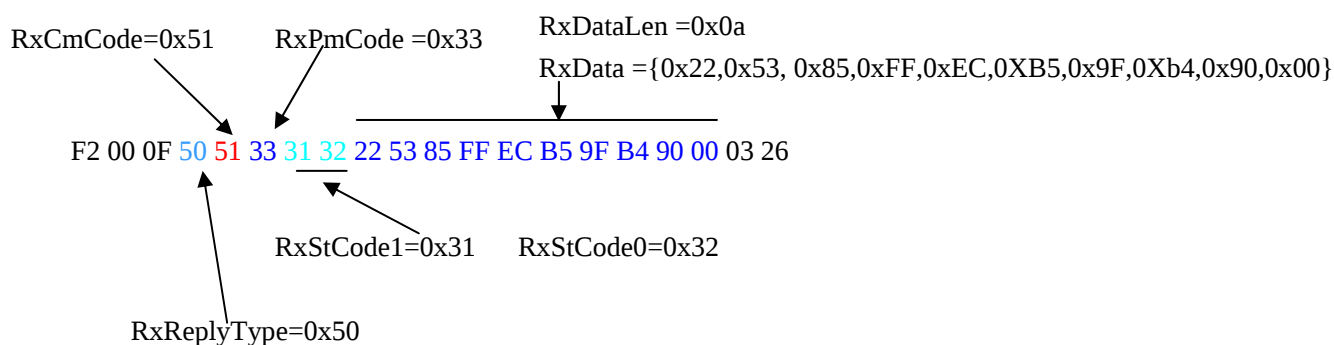
1. Combination of Function Parameter

1.1 Function Parameter Specification According to Communication Protocol

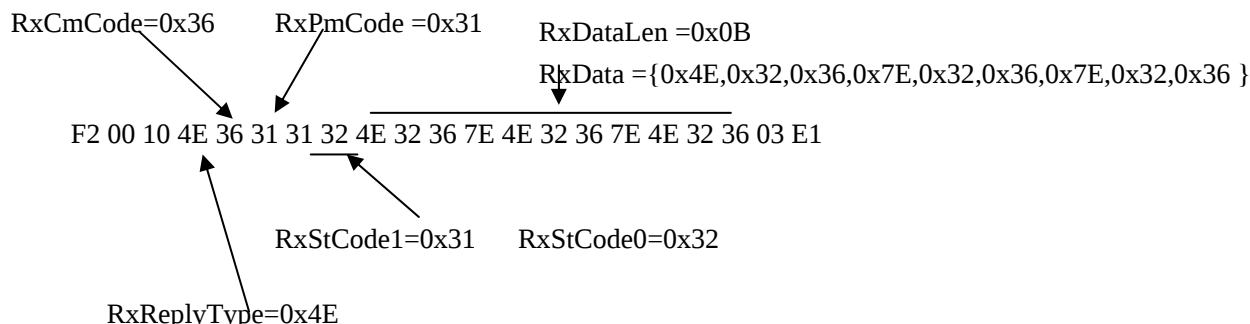
1. Command format (HOST -> ICRW)



2. Positive response format (ICRW -> HOST)



3. Negative response format (ICRW -> HOST)



Notes:

Positive Response: RxReplyType=0x50; RxStCode1 and RxStCode0 is reader status code

Negative Response: RxReplyType=0x4E; RxStCode1 and RxStCode0 is error code

	SPECIFICATION	Model No.	CRT-288K001
		Date	2013/11/19
	DLL	Ver.	V1.0
		Page	4/15

2. API Reference Instruction (RS-232 Interface)

2.1 Function for Open Com Port (Default Baud rate: 38400bps)

HANDLE APIENTRY CRT288KROpen(char *Port);

Parameter:

Port: Com Port Number String

E.g. : CRT288KROpen ("COM1");

Return:

Handle For Com Port

- 0 (Com open failure)
Possible reason for Com open failure:
 - ① Invalid Com Port Number String
 - ② This Com is occupied by other devices
- <>0 Com Open Success

Notes:

- 1) Call this function first to obtain device handle and RS232_ExeCommand is available to use.
- 2) Close Com port by calling **CRT288KRClose()** after use.

	SPECIFICATION	Model No.	CRT-288K001
		Date	2013/11/19
	DLL	Ver.	V1.0
		Page	5/15

2.2 Function for Open Com Port by Specified Baud Rate

HANDLE APIENTRY CRT288KROpenWithBaut(char *Port, unsigned int Baudrate);

Parameter:

Port: Com Port Number String

Baudrate: Baud rate

Baud Rate=9600, 19200, 38400, 57600, 115200。

E.g.: CRT288KROpenWithBaut ("COM1",9600);

Return:

Handle For Com Port

- 0 (Com open failure)
Possible reason for Com open failure:
 - ① Invalid Com Port Number String
 - ② This Com is occupied by other devices
- <>0 Com Open Success

Notes:

- 1) Call this function first to obtain device handle and RS232_ExeCommand is available to use.
- 2) Close Com port by calling **CRT288KRClose()** after use.

	SPECIFICATION	Model No.	CRT-288K001
		Date	2013/11/19
	DLL	Ver.	V1.0
		Page	6/15

2.3 Function For Close Com Port

int APIENTRY CRT288KRClose(HANDLE ComHandle);

Parameter:

ComHandle: Com Handle

Return:

=0 Success
 <>0 Fail

Notes:

CRT288KROpen / CRT288KROpenWithBaut used, Finish call this function to close Com port

	SPECIFICATION	Model No.	CRT-288K001
		Date	2013/11/19
	DLL	Ver.	V1.0
		Page	7/15

2.4 Function for Execution of Command

```
int APIENTRY RS232_ExeCommand(HANDLE ComHandle,BYTE TxCmCode,BYTE TxPmCode,
                               int TxDataLen,BYTE TxData[],
                               BYTE *RxReplyType,BYTE *RxStCode1,BYTE *RxStCode0,
                               int *RxDataLen,BYTE RxData[])
```

Execute command and return reply

Parameter:

ComHandle: Com Handle

TxCmCode: Command Code

TxPmCode: Command Parameter

TxDataLen: Length of Data Package

TxData: Data Package

RxReplyType: Reply Type

0x50 : Success

0x4E : Fail

0x10 : Cancel by Lower Machine (NAK)

0x20 : Communication Error

0x30 : Cancel by HOST machine (EOT)

RxStCode1: Return Status Code1 // Specific Information Please Refer to Communication Protocol

RxStCode0: Return Status Code0 // Specific Information Please Refer to Communication Protocol

RxDataLen: Length of Reply Data Package

RxData: Reply Data

Return:

=0 Success

<>0 Fail

2.5 Function for Active upload Magnetic stripe card data

```
int APIENTRY RS-232_UpTrackData (HANDLE ComHandle,BYTE Tracks,BYTE ReadMode,BYTE WaitTime,
                                BYTE *RxReplyType, int *CardDataLen, BYTE CardData[])
```

Function:

Execute command and response the result

Paramter:

ComHandle: Com Port Handle

Tracks: tracks

ReadMode upload method (insertion or pull out the card)

WaitTime: waiting time for insertion or pull out the card, unit: second

RxReplyType: reply type

0x50 : success

0x4E : failure

RxDataLen: length of reply data

RxData: reply data

	SPECIFICATION	Model No.	CRT-288K001
		Date	2013/11/19
	DLL	Ver.	V1.0
		Page	8/15

return:

- =0 success
- <0 failure
 - 101 open the wrong interface
 - 1 other error
 - 2 parameter error when call the function
 - 3 communication data error
 - 4 time out of insertion or error of pull out the card
 - 5 user cancel

2.6 Function for cancelling insertion or pulling out the card

int APIENTRY RS232_Cancel_UpTrackData (HANDLE ComHandle);

paramter:

ComHandle: Com Port Handle

return:

- =0 success
- <>0 failure

Remark: after execute function of RS232_UpTrackData , once user wants to early end active upload data before reading the data by inserting or pulling out the card yet, use this function.

	SPECIFICATION	Model No.	CRT-288K001
		Date	2013/11/19
	DLL	Ver.	V1.0
		Page	9/15

3 API Reference Instruction2 (USB Interface)

3.1 Function for Open USB

HANDLE APIENTRY CRT288KUOpen ();

Parameter:

E.g.: CRT288KUopen());

Return:

- =0 (Open USB Interface Fail)
Possible reason for Failure:
①The machine is not connected; please check the USB cable and connecter.
- <>0 Open USB Interface success

Notes:

- 1) Call this function first to obtain device handle and USB_ExeCommand is available to use.
- 2) Close com port through function of CRT288KUClose() after use.

	SPECIFICATION	Model No.	CRT-288K001
		Date	2013/11/19
	DLL	Ver.	V1.0
		Page	10/15

3.2 Function For Close of USB Interface

int APIENTRY CRT288KUClose (HANDLE ComHandle);;

Parameter:

ComHandle: Com Port Handle

Return:

- =0 Success
- <>0 Fail

Notes:

CRT288KUClose() should be used together with CRT288KUOpen(), Call this function to close after use

	SPECIFICATION	Model No.	CRT-288K001
		Date	2013/11/19
	DLL	Ver.	V1.0
		Page	11/15

3.3 Function For Open Multiple USB Interface

```
int APIENTRY CRT288KUMultOpen(HANDLE DeviceHdlData[],int *DeviceNumbers);
```

Parameter:

- DeviceHdlData: Device Handle Data
- DeviceNumbers: Device Number

Return:

- =0 Success
- <>0 Fail

Notes:

- 1) Other function can not be called, unless call this function first to get device handle.
- 2) Enable to open device to device handle data for each, but unable to open one port twice simultaneously.
- 3) After use of CRT-288K, call CRT288KUClose (Close solely one device) or CRT288KUMultClose (Close Multiple Device) to close device

	SPECIFICATION	Model No.	CRT-288K001
		Date	2013/11/19
	DLL	Ver.	V1.0
		Page	12/15

3.4 Function For Close Multiple USB Device

```
int APIENTRY CRT288KUMultClose(HANDLE DeviceHdlData[],int DeviceNumbers);
```

Parameter:

- DeviceHdlData: Device Handle Data
- DeviceNumbers: Device Number

Return:

=0 Success

Call CRT288KUMultClose to close multiple devices. This function should be used together with CRT288KUmultOpen

	SPECIFICATION	Model No.	CRT-288K001
		Date	2013/11/19
	DLL	Ver.	V1.0
		Page	13/15

3.5 Function For Command Execution

```
int APIENTRY USB _ExeCommand(HANDLE ComHandle,BYTE Tx CmCode,BYTE TxPmCode,
                             int TxDataLen,BYTE TxData[],
                             BYTE *RxReplyType,BYTE *RxStCode1,BYTE *RxStCode0,
                             int *RxDataLen,BYTE RxData[])
```

Execute command and return reply

Parameter:

- ComHandle: Com Handle
- TxCmCode: Command Code
- TxPmCode: Command Parameter
- TxDataLen: Length of Data Package
- TxData: Data Package
- RxReplyType: Reply Type
 - 0x50 : Success
 - 0x4E : Fail
 - 0x10 : Cancel by lower machine (NAK)
 - 0x20 : Communication Error
 - 0x30 : Cancel by HOST machine (EOT)
- RxStCode1: Return Status Code 1 // Refer to Communication Protocol about Status Code
- RxStCode0: Return Status Code 0 // Refer to Communication Protocol about Status Code
- RxDataLen: Length of reply data
- RxData: Reply Data

Return:

- =0 Success
- <>0 Fail (Close USB connection and re-run CRT288KUopen to connect device)

3.6 Function for Active upload Magnetic stripe card data

```
int APIENTRY USB_UpTrackData (HANDLE ComHandle,BYTE Tracks,BYTE ReadMode,BYTE WaitTime,
                              BYTE *RxReplyType, int *CardDataLen, BYTE CardData[])
```

Function:

Execute command and response the result

Paramter:

- ComHandle: Com Port Handle
- Tracks: tracks
- ReadMode: upload method (insertion or pull out the card)
- WaitTime: waiting time for insertion or pull out the card, unit: second
- RxReplyType: reply type
 - 0x50 : success
 - 0x4E : failure
- RxDataLen: length of reply data
- RxData: reply data

	SPECIFICATION	Model No.	CRT-288K001
		Date	2013/11/19
	DLL	Ver.	V1.0
		Page	14/15

return:

- =0 success
- <0 failure
 - 101 open the wrong interface
 - 1 other error
 - 2 parameter error when call the function
 - 3 communication data error
 - 4 time out of insertion or error of pull out the card
 - 5 user cancel

3.7 Function for cancelling insertion or pulling out the card

int APIENTRY USB_Cancel_UpTrackData (HANDLE ComHandle);

paramter:

ComHandle: Com Port Handle

return:

- =0 success
- <>0 failure

Remark: after execute function of USB_UpTrackData , once user wants to early end active upload data before reading the data by inserting or pulling out the card yet, use this function.

	SPECIFICATION	Model No.	CRT-288K001
		Date	2013/11/19
	DLL	Ver.	V1.0
		Page	15/15

4. API Calling Instruction

4.1 API Calling Instruction

The calling process for USB and RS232 is the same

1. Device Connection

USB interface call CRT288KUOpen function and RS232 interface CRT288KROpen function

2. Communication Process

USB interface call USB_ExeCommand function and RS232 interface RS232_ExeCommand function

3. Device Disconnection

USB interface call CRT288KUClose and RS232 interface CRT288KRClose function

Note:USB interface will automatically close USB device if function calling is unsuccessful and need to execute CRT288KUOpen to re-connect the device