XPOS
Secondary development interface document

Document magament

Version history

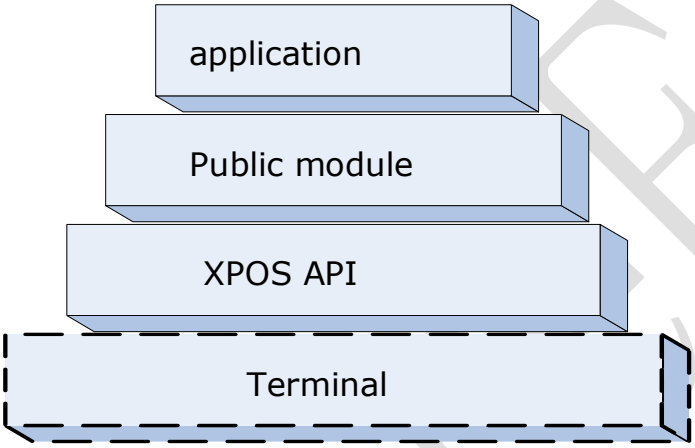
Date	Version	Modify record	Author
20181109	1.0	Basic interface	yangjy
20190219	1.1	Add some interface and Modify some details	LinZhu
20190719	1.2	Add some interface and Modify some details	luoxizhu

Content

1 profile

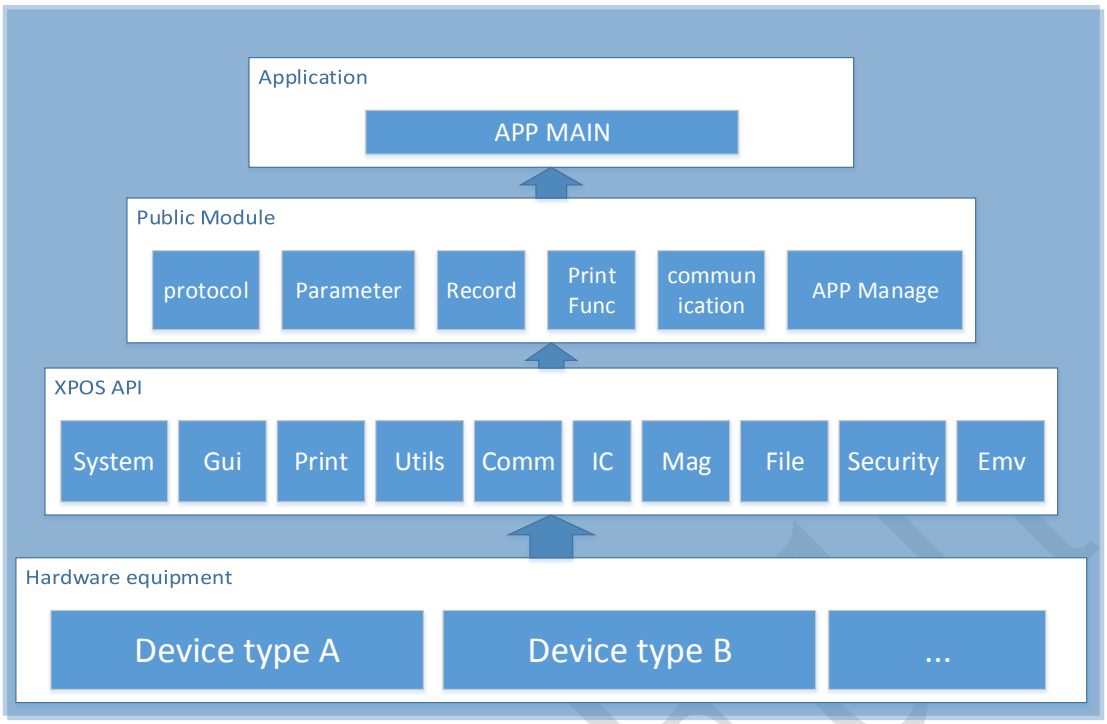
1.1 overall structure

This document provides a comprehensive introduction to the application development interface to assist application developers in better secondary development.



1.1 modular design

The terminal software is divided into modules to face relatively independent devices or functions, to meet the goal of rapid development of terminal software and frequent update of requirements.



2 System module(libapi_system)

2.1 interface list

Function name	Function prototype	Function function
System initialization	Sys_Init	System initialization, independent initialization with application layer
manufacturer personality parameter setting	Sys_Config	Manufacturer personality parameter setting, call each vendor personalization function
Get terminal info	Sys_GetTerminalInfo	Get terminal info
Obtain system time	Sys_GetDateTime	Obtain system time
Set system time	Sys_SetDateTime	Set system time
Scanning buttun	Sys_CheckKey	Scan button, non-blocking

Clear button cache	Sys_ClrKey	Clear button cache
oepn timer	Sys_TimerOpen	Turn on the timer and set the timing
test timer	Sys_TimerCheck	Check if the timing time is up
Close timer	Sys_TimerClose	Close timer
delay	Sys_Delay	Delay, block
Display battery power in real time	Sys_GetBatter	Display battery power in real time
terminal sleep	Sys_Sleep	Terminal enter into sleep status
terminal reboot	Sys_Reboot	terminal reboot
Get network license for terminal	Sys_GetNetworkLicense	Get network license for terminal
Set screen backlight	Sys_SetScrBackLight	Set screen backlight
Get terminal fireware info	Sys_GetFirmwareInfo	Get terminal fireware info
Open Scan	Sys_scaner_open	Open Scan
Start scanning	Sys_scaner_start	Start scanning
Stop scanning	Sys_scaner_stop	Stop scanning
Close Scan	Sys_scaner_close	Close Scan

2.2 API interface

2.2.1 **System initialization(Sys_Init)**

Function prototype	int Sys_Init(int Argc， char **Argv， char *AppName);
Function	System initialization, independent initialization with application layer

function		
Parameter Description	In parameter	Argc：Reuse the main function parameter Argc Argv：Reuse the main function parameter Argv AppName：application name
	Out parameter	none

Return value	USYS_FAIL = -1, // failure
	USYS_FIRST = 1,//First run after the program is updated
	USYS_NOFIRST = 2//The program is not the first time running	

Supplementary explanation	no process for not using in parameter Function internal call vendor private API	
	The API only returns to the first run when the program is newly installed. The program update is not the first run.	

2.2.2 Vendor personality parameter setting**(Sys_Config)**

Function prototype	void Sys_Config(void);	
Function function	Manufacturer personality parameter setting, call each vendor personalization function	
Parameter description	In parameter	none
	Out parameter	none

Return value	
Supplementary explanation	

2.2.3 Get terminal info**(Sys_GetTerminalInfo)**

Function prototype	int Sys_GetTerminalInfo(TERMINALINFO *terminal);	
Function function	Get terminal info	
Parameter description	In parameter	none
	Out parameter	terminal referance TERMINALINFO

Return value	USYS_FAIL = -1, // failure
	USYS_SUCCES= 0， // success	

Supplementary explanation		

2.2.4 Get system time**(Sys_GetDateTime)**

Function prototype	int Sys_GetDateTime(byte *DateTime);
Function function	Get system time

Parameter description	In parameter	None
	Out parameter	DateTime：″YYYYMMDDHHMMSS″ 14 byte

Return value
Supplementary explanation
	USYS_FAIL = -1, // failure
	USYS_SUCCES = 0，// success	

Function prototype		

2.2.5 Set systemn time**(Sys_SetDateTime)**

Function prototype	int Sys_SetDateTime(byte *DateTime);	
Function function	Set system time	
Parameter description	In parameter	DateTime："YYYYMMDDHHMMSS" 14 byte
	Out parameter	None

Return value	USYS_PARAERROR = -2,// parameter wrong
	USYS_FAIL = -1, // failure
	USYS_SUCCES= 0，// success	

Supplementary explanation	API internal judge whether time format is correct	

2.2.6 Scan button**(Sys_CheckKey)**

Function prototype	int Sys_CheckKey(void);	
Function function	Scan button, non-block	
Parameter description	In parameter	none
	Out parameter	none
Return value	Success return key value KEY_VALUE No button return 0 USYS_FAIL = -1, // failure	
Supplementary explanation	None enum KEY_VALUE defined ket, unified return 0	

2.2.7 Clear button cache**(Sys_ClrKey)**

Function prototype	void Sys_ClrKey(void);	
Function function	Clear button cache	
Parameter description	In parameter	none

	Out parameter	none
Return value		
Supplementary explanation		

2.2.8 Open timer**(Sys_TimerOpen)**

Function prototype	int Sys_TimerOpen(uint TimerMs);	
Function function	turn on timer, set timer timing	
Parameter description	In parameter	TimerMs： in millisecond
	Out parameter	none
Return value	success return timer handle USYS_FAIL = -1, // failure	
Supplementary explanation		

2.2.9 Test timer **(Sys_TimerCheck)**

Function prototype	int Sys_TimerCheck(int iHandle);

Function function	test whether timer time is up	
Parameter description	In parameter	iHandle：timer handle
	Out parameter	none
Return value	Successful return, remaining time, in milliseconds (0 means the time is up) USYS_FAIL = -1, // failure	
Supplementary explanation		

2.2.10 Turn off timer**(Sys_TimerClose)**

Function prototype	`int Sys_TimerClose(int iHandle);`	
Function function	`turn off timer`	
Parameter description	In parameter	iHandle：timer handle
	Out parameter	none
Return value	`USYS_FAIL = -1, // failure` `USYS_SUCCESS = 0 // success`	
Supplementary explanation		

2.2.11 delay(Sys_Delay)

Function prototype	void Sys_Delay(uint uiMs);	
Function function	Postpone, block	
Parameter description	In parameter	uiMs: delay time in ms
	Out parameter	none
Return value		
Supplementary explanation		

2.2.12 Terminal sleep (Sys_Sleep)

Function prototype	int Sys_Sleep(uint Time);	
Function function	terminal enter into sleep status	
Parameter description	In parameter	Time: Enter sleep time, in seconds (unsupported manufacturers, considered invalid)
	Out parameter	none

Return value	USYS_FAIL = -1, // failure
	USYS_SUCCESS = 0 // success	

Supplementary explanation	The application needs to detect the wireless network registration status after waking up.

2.2.13 Terminal reboot(Sys_Reboot)

Function prototype	int Sys_Reboot(void);	
Function function	Terminal reboot	
Parameter description	In parameter	none
	Out parameter	none

Return value	USYS_FAIL = -1, // failure
	USYS_SUCCESS = 0 // success	

Supplementary explanation	Each vendor implements according to its own OS and for unsupport, then direct return. (Considering unsupported vendors, the application layer needs to prompt a forced restart after calling the API)	

2.2.14 Open Scan (Sys_scaner_open)

Function prototype	int Sys_scaner_open()

Function function	Open Scan	
Parameter description	In parameter	none
	Out parameter	none
Return value	USYS_SUCCESS = 0 Success	
Supplementary explanation		

2.2.15 Start scanning **(Sys_scaner_start)**

Function prototype	int Sys_scaner_start()	
Function function	Start scanning	
Parameter description	In parameter	none
	Out parameter	none
Return value	USYS_SUCCESS = 0 Success	
Supplementary explanation		

2.2.16 Stop scanning **(Sys_scaner_stop)**

Function prototype	int Sys_scaner_stop()	
Function function	stop scanning	
Parameter description	In parameter	none
	Out parameter	none
Return value	USYS_SUCCESS = 0 Success	
Supplementary explanation		

2.2.17 Close Scan **(Sys_scaner_close)**

Function prototype	int Sys_scaner_close ()	
Function function	Close Scan	
Parameter description	In parameter	none
	Out parameter	none
Return value	USYS_SUCCESS = 0 Success	

Supplementary explanation	

3 Tool module (**libapi_util)**

3.1 interface list

Function name	Function prototype	Function function
ASCII code change to BCD code	Util_Asc2Bcd	ASCII code change to BCD code
BCD code change to ASCII code	Util_Bcd2Asc	BCD code change to ASCII code
Int type data change to BCD code	Util_Int2Bcd	Int type data change to BCD code
BCD code change to int type	Util_Bcd2Int	BCD code data change to int type
Caculate LRC	Util_GenLrc	Calculate and generate LRC check digits (bitwise XOR)
DES encryption and decryption	Util_Des	DES encryption and decryption of data or 3DES encryption and decryption
Chinese character copy	int Util_StrCopy	Chinese intelligent truncation function, solves the problem of displaying half a Chinese character in a line of Chinese
waiting key	Util_WaitKey	Wait for the button within the set time, wait for the timeout without the button
input method	Util_InputMethod	Support data input for input method switching

string input	Util_InputText	Number, letter, password type in
amount input	Util_InputAmount	Input amount
IP input	Util_InputIp	Input IP address
beep	Util_Beep	beep, non-block
Voice play	Play_Voice	voice play, non-block
Production random number	Util_Rand	generate random number

3.2 API interface

3.2.1 ASCII code change to BCD code (Util_Asc2Bcd)

Function prototype	int Util_Asc2Bcd(char *AscBuf, char *BcdBuf, int AscLen)	
Function function	ASCII code change to BCD code	
Parameter description	In parameter	AscBuf: ASCII code data to be converted AscLen: Importing ASCII code data length
	Out parameter	BcdBuf: Convert output BCD code data

Return value	UUTIL_FAIL = -1, // failure
	UUTIL_SUCCESS = 0 // success

Supplementary explanation	'F' Left on the BCD code, after the number of digits is insufficient, make up 'F'

3.2.2 BCD code convert to ASCII code (Util_Bcd2Asc)

Function prototype	int Util_Bcd2Asc(char *BcdBuf, char *AscBuf, int AscLen)	
Function function	BCD code convert to ASCII code	
Parameter description	In parameter	BcdBuf: BCD code data that need to be converted AscLen: ASCII code data length, which is double the length of BCD code data
	Out parameter	AscBuf: Convert output ASCII code data

Return value	UUTIL_FAIL = -1, // failure
	UUTIL_SUCCESS = 0 // success	

Supplementary explanation		

3.2.3 Int type data convert to BCD code (Util_Int2Bcd)

Function prototype	int Util_Int2Bcd(uint IntData, char *BcdBuf, int BcdLen)	
Function function	Int type data convert to BCD code	
Parameter description	In parameter	IntData: Int data to be converted BcdLen：BCD code data length after conversion
	Out parameter	BcdBuf：BCD data after conversion

Return value	UUTIL_FAIL = -1, // failure
	UUTIL_SUCCESS = 0 // success	

Supplementary explanation	Right by BCD code, the number of digits is less then add 0 in the left side	

3.2.4 BCD code convert to int type(Util_Bcd2Int)

Function	int Util_Bcd2Int(char *BcdBuf, uint *IntData, int BcdLen)

prototype		
Function function	BCD code data convert to int type	
Parameter description	In parameter	BcdBuf:BCD data to be converted BcdLen: BCD code data length
	Out parameter	IntData: int type data after conversion

Return value	UUTIL_FAIL = -1, // failure
	UUTIL_SUCCESS = 0 // success	

Supplementary explanation		

3.2.5 **Caculate LRC(Util_GenLrc)**

Function prototype	Byte Util_GenLrc(char *Data, int DataLen)	
Function function	Calculate and generate LRC check digits (bitwise XOR)	
Parameter description	In parameter	Data: Data of the LRC check digit to be calculated DataLen: data length

	Out parameter	
Return value	Calculate the generated LRC check value	
Supplementary explanation		

3.2.6 DES encryption and decryption (Util_Des)

Function prototype	intUtil_Des(bytebDesType,char*Key,char*InData,char*OutData)		
Function function	DES encryption and decryption of data or 3DES encryption and decryption		
Parameter description	In parameter	bDesType：	DES encryption and decryption algorithm: 0 means DES encryption, 1 means DES decryption, 2 means 3DES encryption, 3 means 3DES decryption
		Key：	The transport key used for encryption and decryption must be a multiple of 8.
		InData:	The ciphertext data to be encrypted and decrypted must be 8 bytes.
	Out parameter	OutData：	The encrypted and decrypted key must be 8 bytes.

Return value	UUTIL_FAIL = -1, // failure
	UUTIL_SUCCESS = 0 // success

Supplementary explanation	

3.2.7 Chinese character copy(Util_StrCopy)

Function prototype	int Util_StrCopy(char *dst, cchar *src, int len)	
Function function	Chinese intelligent truncation function, solves the problem of displaying half a Chinese character in a line of Chinese	
Parameter description	In parameter	scr: Source data string len: Source data length
	Out parameter	Dst: target data string
Return value	Returns the length of the copied string	
Supplementary explanation		

3.2.8 Waiting button(Util_WaitKey)

Function prototype	int Util_WaitKey(int TimeOut)	
Function function	Wait for the button within the set time, without button then waiting timeout	
Parameter description	In parameter	TimeOut: Waiting timeout (seconds), 0 means blocking
	Out parameter	
Return value	UUTIL_TIMEOUT Or return button value	
Supplementary explanation		

3.2.9 Input method input(Util_InputMethod)

Function prototype	int Util_InputMethod(int disp_line, char * msgPrompt, int input_line, char *str, int min, int max, byte disp_pattern, int timeout)	
Function function	data input that support input method switching	
Parameter description	In paramater	disp_line: Prompt message shows the number of lines msgPrompt: Prompt message (left alignment) input_line: Input data display line number

		min: Minimum input length max:Maximum input length disp_pattern: Input data display position, 0 left aligned; 1 centered; 2 right alignment timeout: Waiting for input timeout (seconds)
	Out parameter	str: input data

Return value	Success: return the input data str bytes
	UUTIL_TIMEOUT = -3, // input timeout
	UUTIL_CANCEL = -2, // input cancel
	UUTIL_FAIL = -1, // failure	

Supplementary explanation		

3.2.10 String input (Util_InputText)

Function prototype	int Util_InputText(int disp_line, char * msgPrompt, int input_line, char *str, int min, int max, int disp_pattern, byte disp_mode , int timeout)	
Function function	number, letter, password input	
Parameter	In	disp_line: Prompt message shows the number of

description	paramater	lines msgPrompt: Prompt message input_line: Input data display line number min: Minimum input length max: Maximum input length disp_pattern: Display position, 0 left aligned; 1 centered; 2, right aligned disp_mode: Input mode, 0 digital input; 1 number, letter input
		password input timeout: Timeout (seconds)
	Out parameter	str: Input data

Return value	Success: return the input data str bytes
	UUTIL_TIMEOUT = -3, // input timeout
	UUTIL_CANCEL = -2, // input cancel
	UUTIL_FAIL = -1, // failure	

Supplementary explanation	When the input mode is numeric or letter input, switching between a certain number, uppercase and lowercase, and lowercase is performed by pressing a button continuously.	

3.2.11 Amount input(Util_InputAmount)

Function prototype	int Util_InputAmount(int disp_line, char * msgPrompt, int input_line, char *amount, byte disp_ pattern，int timeout)		
Function function	Input amount		
Parameter description	In parameter	disp_line:	Prompt message shows the number of lines
		msgPrompt:	Prompt message
		input_line:	Input data display line number
		disp_pattern:	Display mode, 0 left aligned; 1 centered; 2, right aligned
		timeout:	Timeout (second)
	Out parameter	amount：	Output amount
Return value	Success: return the output amount bytes UUTIL_TIMEOUT = -3, // input timeout		

	UUTIL_CANCEL = -2, // input cancel
	UUTIL_FAIL = -1, // failure		

Supplementary description	the amount input is accurate to cent (two decimal places are reserved) and stored in the Amount variable in 12-bit ASCII code.		

3.2.12 IP input (Util_InputIp)

Function prototype	int Util_InputIp(int disp_line, char * msgPrompt, int input_line, char *ip, byte disp_pattern, int timeout)	
Function function	Enter IP address	
Parameter description	In parameter	disp_line: Prompt message shows the number of lines msgPrompt: prompt message input_line: Input data display line number disp_pattern: Display position, 0 left aligned; 1 centered; 2, right pair Timeout: timeout (seconds)
	Out parameter	ip: enter IP address

Return value	Success: return input IP address bytes
	UUTIL_TIMEOUT = -3, // input timeout
	UUTIL_CANCEL= -2, // input cancel
	UUTIL_FAIL = -1, // failure	

Supplementary explanation	API internal with IP address format judgment	

3.2.13 beep(Util_Beep)

Function prototype	Void Util_Beep(int num)	
Function function	Buzzer, non-blocking	
Parameter description	In paramter	num: Beep times
	Out parameter	
Return value		
Supplementary explanation		

3.2.14 Voice play (Play_Voice)

Function prototype	void Play_Voice(char *msg)	
Function function	Specified line display	
Parameter description	In parameter	Msg: Information that requires voice play
	Out parameter	None

Return value	None
Supplementary explanation	Voice playback is non-blocking

3.2.15 Generate random numbers(Util_Rand)

Function prototype	int Util_Rand(byte *psRandom)	
Function function	Generate random numbers	
Parameter description	In parameter	
	Out parameter	psRandom8byte Binary random number

Return value	UUTIL_FAIL = -1, // failure
	UUTIL_SUCCESS = 0 // success	

Supplementary explanation	Priority use true random numbers	

4 File module(libapi_file)

4.1 Interface list

Function name	Function prototype	function function
Check if the file exists	UFile_Check	Check if the file exists
File open/create	UFile_OpenCreate	File open/create
File reading	UFile_Read	File reading
File writing	UFile_Write	File writing
Positioning file pointer	UFile_Lseek	Positioning file pointer
Delete file record	UFile_Delete	Delete file record
Close file	UFile_Close	Close file
Delete file	UFile_Remove	Delete file
Rename file	UFile_Rename	Rename file
Empty file	UFile_Clear	Empty file content
Take the number of file records	UFile_GetNumberOfRecords	Take the number of file records
Append file record	UFile_AppendRecord	At the end of the file, add a fixed length record file. Automatically create a file when it does not exist
check records based on index number	UFile_GetRecordByIndex	Find any record by record index
Check record	UFile_GetRecord	Find any record by condition
Update record	UFile_UpdateRecord	Update any record by condition
Update records based on index number	UFile_UpdateRecordByIndex	Update any records based on index number

Delete record	UFile_DeleteRecord	Delete any record by condition
Delete records based on index number	UFile_DeleteRecordByIndex	Delete any record by recording the index number
Read a line of text	UFile_ReadLine	Read a line of text and support \r \n newline
Read non-fixed length records	UFile_ReadTLV	Read non-fixed length record TLV, consistent with IC card TVL format
Write non-fixed data	UFile_WriteTLV	Write non-fixed data TLV
Delete non-fixed record	UFile_DeleteTLV	Delete non-fixed record TLV

4.2 API interface

4.2.1 **Check if the file exists (UFile_Check)**

Function prototype	int UFile_Check(cchar *FileName, int iFileLocation);	
Function function	Check if the file exists	
Parameter description	In parameter	FileName: File name, ending with NULL, up to 16 bytes iFileLocation: Storage location, see enum FILELOCATION
	Out parameter	None

Return value	UFILE_NO_EXIST = -12, // The specified file does not exist
	UFILE_PARAERROR = -11, // parameter wrong
	UFILE_SUCCESS = 0 //File operation succeeded

Supplementary explanation	

4.2.2 File open / create(UFile_OpenCreate)

Function prototype	intUFile_OpenCreate(cchar*FileName, intiFileLocation, intFlag, FILE_HANDLE *fh, int RecSize);	
Function function	File open / create	
Parameter description	In parameter	FileName：open file name, end with NULL, maximum 16 bytes in length iFileLocation: storage place, see enum FILELOCATION Flag：Open file mode, the value refer to FileFlags define RecSize：File record size RecSize = 0,Create Open Stream File, Text File RecSize = 1，Create open non-fixed length record (TLV) file 8<=RecSize<=4090 Create open fixed length record file

	Out parameter	Fh：File handle

Return value	UFILE_NO_EXIST = -12, //The specified file does not exist
	UFILE_PARAERROR = -11， //Parameter error
	UFILE_OPEN_FAIL = -2, //Open error
	UFILE_FAIL = -1, //File operation failed
	UFILE_SUCCESS = 0 //File operation succeeded	

Supplementary explanation	RecSize only works for the newly created file For opening a created file, the RecSize parameter should be ignored.	

4.2.3 File read(UFile_Read)

Function prototype	`int UFile_Read(FILE_HANDLE handle, char *buffer, int size);`	
Function function	File reading	
Parameter description	In parameter	handle：Read file handle size：Read data size
	Out parameter	buffer：read data

Return value	The file was read successfully: the return value is equal to the number of bytes actually read.
	UFILE_PARAERROR = -11， // paramter error
	UFILE_READ_FAIL = -5, //reading error
	UFILE_FAIL = -1, //file operation failed

Supplementary explanation	

4.2.4 Write file (UFile_Write)

Function prototype	`int UFile_Write(FILE_HANDLE handle, char *buffer, int size);`	
Function function	File writing	
Parameter description	In parameter	handle：Read file handle size：The size of the data to be written buffer：Data to be written
	Out parameter	None

Return value	File write succeeded: the return value is equal to the number of bytes actually written
	UFILE_PARAERROR = -11， // parameter erro
	UFILE_WRITE_FAIL = -4, //write error
	UFILE_FAIL = -1, //file operation failed

Supplementary explanation	

4.2.5 **Positioning file pointer(UFile_Lseek)**

Function prototype	`long UFile_Lseek(FILE_HANDLE handle, long offset, int origin);`	
Function function	Positioning file pointer	
Parameter description	In parameter	Handle: file handle, offset: offset, origin: starting position, see FileSeekFlags type
	Out parameter	None

Return value	UFILE_PARAERROR = -11， //parameter error
	UFILE_SEEK_FAIL = -6, //Positioning file pointer error	

	UFILE_SUCCESS = 0
Supplementary explanation	

4.2.6 **Delete file record (UFile_Delete)**

Function prototype	int UFile_Delete(FILE_HANDLE handle, uint size);	
Function function	delete file record	
Parameter description	In parameter	handle：file handle size：Number of deleted files
	Out parameter	None

Return value	UFILE_PARAERROR = -11, //parameter error
	UFILE_DELETE_FAIL = -7, //Delete file record error
	UFILE_SUCCESS = 0	

Supplementary explanation	The specific location of the deletion is determined by the File_Lseek() function.	

4.2.7 Close file (UFile_Close)

Function prototype	int UFile_Close(FILE_HANDLE handle);	
Function function	Close file	
Parameter description	In parameter	handle：file handle
	Out parameter	None

Return value	UFILE_PARAERROR = -11, // parameter error
	UFILE_CLOSE_FAIL = -8, //Close file error
	UFILE_FAIL = -1, //File operation failed
	UFILE_SUCCESS = 0 //File operation succeeded	

Supplementary explanation		

4.2.8 Delete file (UFile_Remove)

Function prototype	int UFile_Remove(cchar *filename, int iFileLocation);

Function function	Delete file	
Parameter description	In paramater	fileName：File name, ending with NULL, up to 16 bytes iFileLocation: storage location, see enum FILELOCATION
	Out parameter	None

Return value	UFILE_NO_EXIST = -12, //The specified file does not exist
	UFILE_PARAERROR = -11, //parameter error
	UFILE_FAIL = -1, //File operation failed
	UFILE_SUCCESS = 0 //File operation succeed	

Supplementary explanation		

4.2.9 **Rename file (UFile_Rename)**

Function prototype	int UFile_Rename(cchar *oldname, int iFileLocation, cchar *newname);
Function function	Rename file

Parameter description	In parameter	oldname：old file name iFileLocation: storage location, see enum FILELOCATION newname：new file name
	Out parameter	None
Return value	UFILE_NO_EXIST = -12, //The specified file does not exist	

	UFILE_PARAERRO R = -11， //parameter error
	UFILE_FAIL = -1, //File operation failed
	UFILE_SUCCESS = 0 //File operation succeed	

Supplementary explanation		

4.2.10 Empty file(UFile_Clear)

Function prototype	`int UFile_Clear(cchar *FileName, int iFileLocation);`	
Function function	Empty file content	
Parameter description	In parameter	FileName：File name, ending with NULL, up to 16 bytes iFileLocation: storage location, see enum FILELOCATION
	Out	None

	parameter	

Return value	UFILE_NO_EXIST = -12, //The specified file does not exist
	UFILE_PARAERROR = -11， //parameter error
	UFILE_FAIL = -1, //File operation failed
	UFILE_SUCCESS = 0 //File operation succeed	

Supplementary explanation		

4.2.11 Get the number of file records (UFile_GetNumberOfRecords)

Function prototype	int UFile_GetNumberOfRecords(cchar *FileName, int iFileLocation, int Record_Len);	
Function function	Get the number of file records	
Parameter description	In parameter	FileName： file name iFileLocation: storage location，see enum FILELOCATION Record_Len：Single record length
	Out parameter	None

Return value	Success: Returns the number of records
	failure: UFILE_PARAERROR = -11, //parameter error
	UFILE_FAIL = -1, //file operation failed

Supplementary explanation	

4.2.12 Append file record(UFile_AppendRecord)

Function prototype	int UFile_AppendRecord(cchar *FileName, int iFileLocation, char *Record, int Record_Len);	
Function function	At the end of the file, add a fixed length record file. When the file does not exist, automatically create the file;	
Parameter description	In parameter	FileName：File name, ending with NULL, up to 16 bytes iFileLocation: storage location，see enum FILELOCATION Record：record data
		Record_Len：record the length of data
	Out parameter	None

Return value	UFILE_PARAERROR = -11， // parameter error
	UFILE_FAIL = -1, // file operation failed
	UFILE_SUCCESS = 0 //file operation succeed	

Supplementary explanation	Power failure protection	

4.2.13 Query records based on index number(UFile_GetRecordByIndex)

Function prototype	int UFile_GetRecordByIndex(cchar *FileName, int iFileLocation, void *Record, int Record_Len, uint Record_Index);	
Function function	Find any record by record index	
Parameter description	In parameter	FileName : file name iFileLocation: storage location, see enum FILELOCATION Record_Len: record length Record_Index : Record index (starting at 0)
	Out parameter	Record: record data

Return value	UFILE_NO_EXIST = -12, //The specified file does not exist
	UFILE_PARAERROR = -11, //parameter error
	UFILE_NO_RECORD = -10, //record not found
	UFILE_READ_FAIL = -5, //reading error
	UFILE_OPEN_FAIL = -2, //opening error
	UFILE_FAIL = -1, //File operation failed
	UFILE_SUCCESS = 0 //File operation succeed	

Supplementar		

y explanation	

4.2.14 Check record(UFile_GetRecord)

Function prototype	int UFile_GetRecord(cchar *FileName, int iFileLocation, void *Record, int Record_Len, DBSEARCOND *Condtion);	
Function function	Find any record by condition	
Parameter description	In parameter	FileName：file name iFileLocation: storage location，see enum FILELOCATION Record_Len：record length Condtion：query condition, see DBSearCond structure
	Out parameter	Record：record data

Return value	UFILE_NO_EXIST = -12, //The specified file does not exist
	UFILE_PARAERROR = -11, //parameter error
	UFILE_NO_RECORD = -10, //record not found
	UFILE_READ_FAIL = -5, //reading error
	UFILE_OPEN_FAIL = -2, //opening error
	UFILE_FAIL = -1, //File operation failed
	UFILE_SUCCESS = 0 //File operation succeed	

Supplementary explanation	

4.2.15 Update record(UFile_UpdateRecord)

Function prototype	int UFile_UpdateRecord(cchar *FileName, int iFileLocation, void *Record, int Record_Len, DBSEARCOND *Condtion);	
Function function	Update any record by condition	
Parameter description	In parameter	FileName：file name
		iFileLocation: storage location, see enum FILELOCATION Record：record data Record_Len：record length Condtion：query condition, see DBSearCond structure
	Out parameter	Record

Return value	UFILE_NO_EXIST = -12, //The specified file does not exist
	UFILE_PARAERROR = -11， //parameter error
	UFILE_NO_RECORD = -10, //record not founded UFILE_READ_FAIL = -5, // read error
	UFILE_WRITE_FAIL = -4, //write error
	UFILE_OPEN_FAIL = -2, // opening error
	UFILE_FAIL = -1, //File operation failed
	UFILE_SUCCESS = 0 //File operation succeed

Supplementary explanation	Power failure protection Record is both in parameter and out parameter In the case of a successful search, the Record is populated by the search results.

4.2.16 Update records based on index number(UFile_UpdateRecordByIndex)

Function prototype	intUFile_UpdateRecordByIndex(cchar*FileName,intiFileLocation, void *Record, int Record_Len, uint Index);
Function function	Update any record by index number

Parameter description	In parameter	FileName：file name iFileLocation: storage location，see enum FILELOCATION Record：record data
		Record_Len：record length Index： Record index number
	Out parameter	Record

Return value	UFILE_NO_EXIST = -12, //The specified file does not exist
	UFILE_PARAERROR = -11， //parameter error
	UFILE_NO_RECORD = -10, //record not founded UFILE_READ_FAIL = -5, // reading error
	UFILE_WRITE_FAIL = -4, // writing error
	UFILE_OPEN_FAIL = -2, // opening error
	UFILE_FAIL = -1, //File operation failed
	UFILE_SUCCESS = 0 //File operation succeed	

Supplementary explanation	Power failure protection Record is both in parameter and out parameter In the case of a successful search, the Record is populated by the search results.	

4.2.17 Delete record (UFile_DeleteRecord)

Function prototype	int UFile_DeleteRecord(cchar *FileName, int iFileLocation, int Record_Len, DBSEARCOND *Condtion);	
Function function	Delete any record by condition	
Parameter description	In parameter	FileName：file name iFileLocation: storage location, see enum FILELOCATION Record_Len：record length Condtion：query condition，see DBSearCond structure
	Out parameter	

Return value	UFILE_NO_EXIST = -12, //The specified file does not exist
	UFILE_PARAERR = -11, //parameter error
	UFILE_NO_RECORD = -10, //record not founded
	UFILE_DELETE_FAIL = -7, //Delete file record error
	UFILE_OPEN_FAIL = -2, //opening error
	UFILE_FAIL = -1, //File operation failed
	UFILE_SUCCESS = 0 //File operation succeed	

Supplementary explanation	Power failure protection	

4.2.18 Delete records based on index number(UFile_DeleteRecordByIndex)

Function prototype	intUFile_DeleteRecordByIndex(cchar*FileName,intiFileLocation, int Record_Len, uint Index);	
Function function	Delete any record by recording the index number	
Parameter description	In parameter	FileName：file name iFileLocation: storage location，see enum FILELOCATION Record_Len：record length Index： record index number
	Out parameter	

Return value	UFILE_NO_EXIST = -12, //specified file not existed
	UFILE_PARAERROR = -11, //parameter error
	UFILE_NO_RECORD = -10, //record not founded
	UFILE_DELETE_FAIL = -7, //Delete file record error	

	UFILE_OPEN_FAIL = -2, //opening error
	UFILE_FAIL = -1, //File operation failed
	UFILE_SUCCESS = 0 //File operation succeed	

Supplementary explanation	Power failure protection	

4.2.19 Read one line text(UFile_ReadLine)

Function prototype	int UFile_ReadLine(FILE_HANDLE pFile, char *pLineBuff,uint LineBuffSize);	
Function function	Read a line of text, and support \r \n newline (data read out should not contain newline)	
Parameter description	In parameter	pFile：file handle LineBuffSize：Buffer size
	Out parameter	pLineBuff ：Read text data

Return value	Success: data length
	UFILE_PARAERROR = -11, // parameter error
	UFILE_READ_FAIL = -5, // reading error
	UFILE_FAIL = -1, //file operation failed	

Parameter description	For a text file, read a row of data from the current location and jump to the next row.	

4.2.20 Read non-fixed length records (UFile_ReadTLV)

Function prototype	int UFile_ReadTLV(char *FileName, int iFileLocation, uint FldID, char *Data, uint *DataLen);
Function function	Read non-fixed length record TLV, consistent with IC card TVL format

Parameter description	In parameter	FileName: file name iFileLocation: storage location, see enum FILELOCATION
		FldID: tag (Tag)
	Out parameter	Data: data (Value) DataLen: length (length)
Return value	UFILE_NO_EXIST = -12,	//The specified file does not exist
	UFILE_PARAERROR = -11,	// parameter error
	UFILE_NO_RECORD = -10,	//record not founded
	UFILE_READ_FAIL = -5,	// reading error
	UFILE_OPEN_FAIL = -2,	//opening error
	UFILE_FAIL = -1,	//File operation failed
	UFILE_SUCCESS = 0	//File operation succeed
Parameter description	Read the record in TLV format	

4.2.21 Write non-fixed data(UFile_WriteTLV)

Function prototype	int UFile_WriteTLV(char *FileName, int iFileLocation, uint FldID, char *Data, uint DataLen);
Function function	Write non-fixed length record TLV

Parameter description	In parameter	FileName： file name iFileLocation: storage location， see enum FILELOCATION FldID：tag (Tag) Data：data (Value) DataLen：length (length)
	Out parameter	none

Return value	UFILE_NO_EXIST = -12, //specified file does not existed
	UFILE_PARAERROR = -11， //parameter error	

	UFILE_WRITE_FAIL = -4, //writing error
	UFILE_OPEN_FAIL = -2, //opening error
	UFILE_FAIL = -1, //File operation failed
	UFILE_SUCCESS = 0 //File operation succeed	

Supplementary description		

4.2.22 Delete non-fixed length record (UFile_DeleteTLV)

Function prototype	int UFile_DeleteTLV(char *FileName, int iFileLocation, uint FldID);

Function function	Delete non-fixed length record TLV	
Parameter description	In parameter	FileName : file name iFileLocation: storage location, see enum FILELOCATION FldID: tag(Tag)
	Out parameter	None

Return value	UFILE_NO_EXIST = -12, //specified file does not exist
	UFILE_PARAERROR = -11, //parameter error
	UFILE_NO_RECORD = -10, //record not founded
	UFILE_DELETE_FAIL = -7, //Delete file record error
	UFILE_OPEN_FAIL = -2, //opening error
	UFILE_FAIL = -1, //File operation failed
	UFILE_SUCCESS = 0 //File operation succeed	

Supplementary description		

5 IC card module (libapi_iccard)

5.1 interface list

function name	function prototype	Function function
Turn on IC card device	Icc_Open	Turn on IC card device
Turn off IC card device	Icc_Close	Turn off IC card device
Check the card	Icc_GetCardStatus	Contact card: Check if the card is in the card slot
Contact card powering	Icc_PowerUp	Powering on contact IC card: setting IC card type, card slot category
Contact card power off	Icc_PowerDown	Contact card power off
Contact card communication	Icc_ICComm	Contact IC card communication function
NFC card card search	Icc_CTLSPowerUpAndSeek	NFC card reader search card
NFC card power off	Icc_CTLSPowerDown	NFC card power off
NFC card communication	Icc_CTLSComm	Use APDU to communicate with NFC card

5.2 API interface

5.2.1 Turn on IC card device（Icc_Open)

Function prototype	int Icc_Open(int iSlotType);
Function function	Turn on IC card device

Parameter description	In paramate	iSlotType：card slot number，see enum SlotType
	Out parameter	None
Return value	UICC_FAIL = -1,// operation failed UICC_OK = 0// operation succeed	
Supplementary description		

5.2.2 Turn off IC card device (Icc_Close)

Function prototype	int Icc_Close(int iSlotType);	
Function function	Turn off IC card device	
Parameter description	In parameter	iSlotType：card slot number，see enum SlotType
	Out parameter	None

Return value	UICC_FAIL = -1, // operation failed
	UICC_OK = 0 // operation succeed	

Supplementary description	

5.2.3 Turn off IC card device (Icc_Close)

Function prototype	int Icc_CTLSComm(int iCardType,int iSlotType , ICCAPDU *Apdu);	
Function function	Use APDU to communicate with NFC card	
Parameter description	In parameter	iCardType：NFC card type, see enum IccType iSlotType：card slot, see enum SlotType Apdu：refer to ICCAPDU Structure description The various types of card operations are based on the type of OperType operation in the ICCAPDU structure. The data that needs to be passed in during various card operations and the way it is stored in the Apdu structure are discussed separately.
	Out parameter	Apdu：refer to ICCAPDU structure description The returned data is based on the type of OperType operation in the ICCAPDU structure, placed in R_Data

Return value	UICC_COMMAND_FAIL = -2,// Communication error with card
	UICC_FAIL = -1, // operation failed
	UICC_OK = 0 // operation succeed

Supplementary description	

5.2.4 Test card(Icc_GetCardStatus)

Function prototype	int Icc_GetCardStatus(int iSlotType);	
Function function	Contact card: Check if the card is in the card slot	
Parameter description	In parameter	iSlotType：card slot number，refer to enum SlotType
	Out parameter	
Return value	UICC_EMPTY = -3,// no card in card slot UICC_FAIL = -1,// operation failed	

	UICC_OK = 0// operation succeed
Supplementary description	Please call first to open the IC card device (Icc_Open)

5.2.5 Contact card power on(Icc_PowerUp)

Function prototype	int Icc_PowerUp(int iCardType, int iSlotType);	
Function function	Powering on the contact IC card: Set the IC card type and card slot category.	
Parameter description	In parameter	iCardType：IC card type，see enum IccType iSlotType：card slot type，refer to enum SlotType
	Out parameter	None
Return value	UICC_EMPTY = -3,// no card in card slot UICC_FAIL = -1,// operation failure UICC_OK = 0// operation succeed	
Supplementary description	Contains the card reset operation, and subsequently obtains the card reset information through Icc_GetCardATR	

5.2.6 Contact card power off (Icc_PowerDown)

Function prototype	int Icc_PowerDown(int iCardType , int iSlotType);	
Function function	contact card power off	
Parameter description	In papameter	iCardType：IC card type，see enum IccType iSlotType： card slot type， see enum SlotType
	Out parameter	None
Return value	UICC_FAIL = -1,// operation failure UICC_OK = 0// operation succeed	
Supplementary description	Pay attention to call after power off. Close the IC card device (Icc_Close)	

5.2.7 Contact card communication (Icc_ICComm)

Function prototype	int Icc_ICComm (int iCardType,int iSlotType, ICCAPDU *Apdu);

Function function	Contact IC card communication function	
Parameter description	In parameter	iCardType：IC card type，see enum IccType iSlotType： card slot type， see enum SlotType Apdu：refer to ICCAPDU structure The various types of card operations are based on the type of OperType operation in the ICCAPDU structure.
		The data that needs to be passed in during various card operations and the way it is stored in the Apdu structure are discussed separately.
	Out parameter	Apdu：refer to ICCAPDU structure The returned data is based on the type of OperType operation in the ICCAPDU structure, placed in R_Data
Return value	UICC_COMMAND_FAIL= -2,// Communication error with card UICC_FAIL = -1,// operation failure UICC_OK = 0// operation succeed	
Supplementary description	None	

5.2.8 NFC card searching card (Icc_CTLSPowerUpAndSeek)

Function prototype	int Icc_CTLSPowerUpAndSeek (int iCardType, int iSlotType, char *psUID);	
Function function	NFC card reader searching card	
Parameter description	In parameter	iCardType： NFC card type, see enum IccType iSlotType：card slot, see enum SlotType
	Out parameter	psUID：Card serial number, the first byte is the serial number length
Return value	UICC_NORF = -4,// no NFC card UICC_FAIL = -1,// operation failure UICC_OK = 0// operation succeed	
Supplementary description	Please call first to open the IC card device (Icc_Open) Contains card reset operation application layer loop call Get card reset information via Icc_GetCardATR	

5.2.9 NFC card power off(Icc_CTLSPowerDown)

Function prototype	int Icc_CTLSPowerDown (int iSlotType);	
Function function	NFC card power off	
Parameter description	In parameter	iSlotType：card slot number，see enum SlotType
	Out parameter	None
Return value	UICC_FAIL = -1,// operation failure UICC_OK = 0// operation succeed	
Supplementary description	Pay attention to call after power off. Close the IC card device (Icc_Close)	

5.2.10 Use APDU to communicate with NFC card(Icc_CTLSComm)

Function prototype	int Icc_CTLSComm(int iCardType,int iSlotType , ICCAPDU *Apdu);
Function function	use APDU to communicate with NFC card

Parameter description	In parameter	iCardType：NFC card type，see enum IccType iSlotType：card slot，see enum SlotType Apdu：refer to ICCAPDU structure description The various types of card operations are based on the type of OperType operation in the ICCAPDU structure. The data that needs to be passed in during various card operations and the way it is stored in the Apdu structure are discussed separately.
	Out parameter	Apdu：refer to ICCAPDU structure description The returned data is based on the type of OperType operation in the ICCAPDU structure, placed in R_Data
Return value	UICC_COMMAND_FAIL= -2,// communication error with card UICC_FAIL = -1,// operation failure UICC_OK = 0// operation succeed	
Supplementary description		

6 communication（ libapi_comm）

6.1 interface list

Function prototype	Function function
comm_net_link	Connect Network
comm_net_unlink	Disconnect from the network
comm_sock_connect	connect to the server
comm_sock_recv	Receive data
comm_sock_send	send data
comm_sock_close	Disconnect the server
comm_ssl_init	ssl initialization
comm_ssl_connect	ssl connect to the server
comm_ssl_connect2	ssl connect to the server
comm_ssl_send	ssl send data
comm_ssl_recv	ssl Receive data
comm_ssl_close	ssl Disconnect

6.2 API interface

6.2.1 comm_net_link

Function prototype	`int comm_net_link(char * title, char * apn , int timeover);`	
Function function	Connect Network	
Parameter description	In parameter	title：Tips for connecting to the network apn：gprs apn timeover：Connection timeout

	Out parameter	
Return value	0, success Other, failure	
Supplementary description		

6.2.2 **comm_net_unlink**

Function prototype	int comm_net_unlink();	
Function function	Disconnect from the network	
Parameter description	In parameter	
	Out parameter	
Return value	0, success Other, failure	
Supplementary description		

6.2.3 comm_sock_connect

Function prototype	int comm_sock_connect(int index, char * ip, int port);	
Function function	Connect to the server	
Parameter description	In parameter	index sock index ip server ip port server port
	Out parameter	
Return value	0, success Other, failure	
Supplementary description		

6.2.4 comm_sock_recv

Function prototype	int comm_sock_recv(int index, unsigned char * buff, int len, unsigned int timeover);	
Function function	Receive data	
Parameter description	In parameter	index sock index buff Receive buffer len Receiving length

		timeover overtime time
	Out parameter	
Return value	0, success Other, failure	
Supplementary description		

6.2.5 **comm_sock_send**

Function prototype	int comm_sock_send(int index, unsigned char * buff , int size);	
Function function	send data	
Parameter description	In parameter	index sock index buff Send buffer len Send length
	Out parameter	
Return value	0, success Other, failure	

Supplementary description	

6.2.6 comm_sock_close

Function prototype	int comm_sock_close(int index);	
Function function	Disconnect the server	
Parameter description	In parameter	index sock index
	Out parameter	
Return value	0, success Other, failure	
Supplementary description		

6.2.7 comm_ssl_init

Function prototype	int comm_ssl_init(int index, char * cacert, char * clientcert, char * clientkey,int level);
Function function	ssl initialization

Parameter description	In parameter	index sock index cacert Server certificate clientcert Client certificate clientkey Client key level Verification level 0=Not verified 1=Verify server certificate
	Out parameter	
Return value	0, success Other, failure	
Supplementary description		

6.2.8 **comm_ssl_connect**

Function prototype	int comm_ssl_connect(int index , char * ip , int port);	
Function function	ssl connect to the server	
Parameter description	In parameter	index sock index ip server ip port server port
	Out parameter	

Return value	0, success Other, failure
Supplementary description	

6.2.9 comm_ssl_connect2

Function prototype	int comm_ssl_connect2(int index , char * ip , int port, void *func);	
Function function	ssl connect to the server	
Parameter description	In parameter	index sock index ip server ip port server port func callback - Disconnect by callback
	Out parameter	
Return value	0, success Other, failure	
Supplementary description		

6.2.10 comm_ssl_send

Function prototype	int comm_ssl_send(int index, char * pdata, int size);	
Function function	ssl send data	
Parameter description	In parameter	index sock index data ssl data size Data size
	Out parameter	
Return value	0, success Other, failure	
Supplementary description		

6.2.11 comm_ssl_recv

Function prototype	int comm_ssl_recv(int index, char * pdata, int size);	
Function function	ssl Receive data	
Parameter description	In parameter	index sock index data ssl data size Data size
	Out parameter	

Return value	0, success Other, failure
Supplementary description	

6.2.12 comm_ssl_close

Function prototype	int comm_ssl_close(int index);	
Function function	ssl Disconnect	
Parameter description	In parameter	index sock index
	Out parameter	
Return value	0, success Other, failure	
Supplementary description		

6.2.13 comm_wifi_list_ap

Function prototype	int comm_wifi_list_ap(st_wifi_ap_list * ap_list);	
Function function	Get the router list	
Parameter description	In parameter	
	Out parameter	ap_list Router list data, The ap_list space is allocated by the caller with an array size of 10
Return value	Number of routers	
Supplementary description		

6.2.14 comm_wifi_link_ap

Function prototype	int comm_wifi_link_ap(st_wifi_ap_list * ap_list , char * pwd);	
Function function	Connecting router	
Parameter description	In parameter	ap_list: Router data pwd: password
	Out parameter	

Return value	0, success Other, failure
Supplementary description	

6.2.15 comm_wifi_unlink_ap

Function prototype	int comm_wifi_unlink_ap();	
Function function	unlink router	
Parameter description	In parameter	
	Out parameter	ap_list Router list data, The ap_list space is allocated by the caller with an array size of 10
Return value	0, success Other, failure	
Supplementary description		

6.2.16 comm_wifi_get_link_state

Function prototype	int comm_wifi_get_link_state();	
Function function	Get connection status	
Parameter description	In parameter	
	Out parameter	
Return value	1, connection 0 , disconnect	
Supplementary description		

7 security（ libapi_security）

7.1 interface list

Function prototype	Function function
mksk_save_plaintext_key	Save key plaintext
mksk_save_encrypted_key	Save key ciphertext
mksk_3des_run	Use key 3des operation

dukpt_get_ksn	Get a set of dukpt keys
dukpt_3des_run	Use the previously obtained key 3des operation
dukpt_init_key	Initialize the dukpt key
sec_mac_proc	Computing mac
sec_encrypt_pin_proc	Read pin ciphertext from the security keyboard
sec_set_pin_mode	Set enable/disable pin input mode
sec_save_rsa_pri_key	Save the private key to the security module
sec_save_rsa_puk_key	Save the public key to the security module
sec_rsa_block	RSA block calculation
sec_get_hw_ver	get pci hardware version
sec_get_fw_ver	get pci firmware version

7.2 API interface

7.2.1 mksk_save_plaintext_key

Function prototype	int mksk_save_plaintext_key(int type, int gid, unsigned char * key, unsigned char *kvc);	
Function function	Save key plaintext	
Parameter description	In parameter	type: Key type(0x00-0x04) gid : Key grouping(0-9) key : Key plaintext

	Out parameter	kvc Key kvc(Key plaintext encryption 8 0x00)
Return value	0, success Other, failure	
Supplementary description		

7.2.2 **mksk_save_encrypted_key**

Function prototype	int mksk_save_encrypted_key(int type, int gid, unsigned char * key, unsigned char *kvc);	
Function function	Save key ciphertext	
Parameter description	In parameter	type: Key type(0x00-0x04) gid : Key grouping(0-9) key : Key plaintext
	Out parameter	kvc Key kvc(Key plaintext encryption 8 0x00)
Return value	0, success Other, failure	
Supplementary description		

7.2.3 mksk_3des_run

Function prototype	int mksk_3des_run(int type, int gid, int mode, unsigned char *ind, int size, unsigned char *outd);	
Function function	Use key 3des operation	
Parameter description	In parameter	type: Key type(0x00-0x04) gid : Key grouping(0-9) mode: Operation type (encryption/decryption) ind: Raw data size: Data length (8-byte multiple)
	Out parameter	outd: Calculation results
Return value	0, success Other, failure	
Supplementary description		

7.2.4 dukpt_get_ksn

Function prototype	int dukpt_get_ksn(unsigned char gid, unsigned char * ksn);
Function function	Get a set of dukpt keys

Parameter description	In parameter	gid ： Key grouping,0
	Out parameter	ksn: Key corresponds to ksn
Return value	0, success Other, failure	
Supplementary description		

7.2.5 **dukpt_3des_run**

Function prototype	int dukpt_3des_run(int mode, char *ind, int size, char *outd);	
Function function	Use the previously obtained key 3des operation	
Parameter description	In parameter	mode: Operation type (encryption/decryption) ind: Raw data size: Data length (8-byte multiple)
	Out parameter	outd: Calculation results
Return value	0, success Other, failure	

Supplementary description	

7.2.6 dukpt_init_key

Function prototype	int dukpt_init_key(unsigned char gid, unsigned char* init_ksn, unsigned char* init_key);	
Function function	Initialize the dukpt key	
Parameter description	In parameter	gid: Key grouping init_ksn: Initial ksn init_key: Initial key
	Out parameter	
Return value	0, success Other, failure	
Supplementary description		

7.2.7 sec_mac_proc

Function prototype	int sec_mac_proc(int fid, int gid, int format, char *data, int len, char *mac, char * ksn);	
Function function	Computing mac	
Parameter description	In parameter	fid:SEC_MKSK_FIELD/SEC_DUKPT_FIELD gid: Key grouping, 0-9

		format: SEC_MAC_UPAY_FORMAT... data: mac source data len: data length ksn: dukpt ksn
	Out parameter	mac: result
Return value	0, success Other, failure	
Supplementary description		

7.2.8 **sec_encrypt_pin_proc**

Function prototype	int sec_encrypt_pin_proc(int fid, int format, int gid, char * pan, char *pinblock, char * ksn);	
Function function	Read pin ciphertext from the security keyboard	
Parameter description	In parameter	fid: SEC_MKSK_FIELD/SEC_DUKPT_FIELD gid: Key grouping, 0-9 format:SEC_PIN_FORMAT0-SEC_PIN_FORMAT4 pan: card number
	Out parameter	ksn: dukpt ksn
Return value	0, success Other, failure	

Supplementary description	

7.2.9 sec_set_pin_mode

Function prototype	void sec_set_pin_mode(int mode, int length);	
Function function	Set enable/disable pin input mode	
Parameter description	In parameter	mode: 1 open 0 close length: Pin input length
	Out parameter	
Return value	0, success Other, failure	
Supplementary description		

7.2.10 sec_save_rsa_pri_key

Function prototype	int sec_save_rsa_pri_key(int index, int length, char * p, char * q);
Function function	Save the private key to the security module

Parameter description	In parameter	Parameter description
	Out parameter	index:key index(0-9) length:rsa byte size(128/256) p:Private key P component q:Private key Q component
Return value	0, success Other, failure	
Supplementary description		

7.2.11 sec_save_rsa_puk_key

Function prototype	int sec_save_rsa_puk_key(int index, int length, char * n);	
Function function	Save the public key to the security module	
Parameter description	In parameter	index: key index(0-9) length: rsa key byte size(128/256) n: public key N component
	Out parameter	
Return value	0, success Other, failure	

Supplementary description	

7.2.12 sec_rsa_block

Function prototype	int sec_rsa_block(int index, char * ind, char *outd, int length);	
Function function	RSA block calculation	
Parameter description	In parameter	index: key index(0-9) length: rsa key byte size(128/256) ind: in data
	Out parameter	outd: out data
Return value	0, success Other, failure	
Supplementary description		

7.2.13 sec_get_hw_ver

Function prototype	char * sec_get_hw_ver();
Function function	get pci hardware version

Parameter description	In parameter	
	Out parameter	
Return value	hardware version	
Supplementary description		

7.2.14 sec_get_fw_ver

Function prototype	char * sec_get_fw_ver();	
Function function	get pci firmware version	
Parameter description	In parameter	
	Out parameter	
Return value	firmware version	
Supplementary description		

8 Gui （libapi_gui）

8.1 interface list

Function prototype	Function function
gui_bar_rc	Gui filled area
gui_set_bar_color	Set the fill color
gui_get_bar_color	Get the fill color
gui_set_font	Set display font
gui_get_font	Get display font
gui_set_text_color	Set text color
gui_get_text_color	Get text color
gui_set_text_bg_color	Set the text background color
gui_get_text_bg_color	Get the text background color
gui_clear_dc	Clear screen display
gui_set_color	Set the foreground color
gui_get_color	Get the foreground color
gui_set_bg_color	Set the background color
gui_get_bg_color	Get the background color
gui_set_pixel	Draw on the screen
gui_get_pixel	The color of the point on the screen
gui_pixel	Draw a point
gui_text_out	Display text on the screen
gui_text_out_ex	Display text on the screen
gui_get_text_width	Get the display width of the text
gui_get_text_height	Get the display height of the text
gui_cline	Draw line
gui_line_to	Draw line

gui_get_width	Get screen width
gui_get_height	Get screen height
gui_page_op_paint	Display characters at the bottom left and bottom of the screen
gui_ime_set_mode	Set input method parameters
gui_ime_start_input	Open the input method page
gui_main_menu_func_add	Add menu handler
gui_main_menu_item_add	Add menu item
gui_main_menu_show	Add menu handler
gui_post_message	Send a message
gui_get_message	Recv a message
gui_proc_default_msg	Let the system process the default message
gui_messagebox_show	Display dialog
gui_load_bmp	Load bmp into memory
gui_out_bits	display image
gui_out_bits_ex	display image
gui_settextstyle	Setting Text Styles
gui_text_width_ex	get text width
gui_begin_batch_paint	Batch refresh starts
ui_end_batch_paint()	End of batch refresh

8.2 API interface

8.2.1 **gui_bar_rc**

Function prototype	void gui_bar_rc(int left, int top, int right, int bottom);
Function function	Gui filled area

Parameter description	In parameter	left Left border top Upper boundary right Right border bottom Lower boundary
	Out parameter	
Return value	0, success Other, failure	
Supplementary description		

8.2.2 **gui_set_bar_color**

Function prototype	void gui_set_bar_color(int color);	
Function function	Set the fill color	
Parameter description	In parameter	color Color format 0x00RRGGBB
	Out parameter	
Return value	0, success Other, failure	

Supplementary description	

8.2.3 gui_get_bar_color

Function prototype	int gui_get_bar_color();	
Function function	Get the fill color	
Parameter description	In parameter	
	Out parameter	
Return value	Fill color	
Supplementary description		

8.2.4 gui_set_font

Function prototype	Set display font
Function function	void gui_set_font(int font);

Parameter description	In parameter	font 0=12 lattice 1=16 lattice
	Out parameter	
Return value		
Supplementary description		

8.2.5 **gui_get_font**

Function prototype	int gui_get_font(void);	
Function function	Get display font	
Parameter description	In parameter	
	Out parameter	
Return value	Font index	
Supplementary description		

8.2.6 gui_set_text_color

Function prototype	void gui_set_text_color(int color);	
Function function	Set text color	
Parameter description	In parameter	color text color
	Out parameter	
Return value		
Supplementary description		

8.2.7 gui_get_text_color

Function prototype	int gui_get_text_color(void);	
Function function	Get text color	
Parameter description	In parameter	

	Out parameter	
Return value	Text color	
Supplementary description		

8.2.8 gui_set_text_bg_color

Function prototype	void gui_set_text_bg_color(int color) ;	
Function function	Set the text background color	
Parameter description	In parameter	cloro text color
	Out parameter	
Return value		
Supplementary description		

8.2.9 gui_get_text_bg_color

Function prototype	int gui_get_text_bg_color(void);	
Function function	Get the text background color	
Parameter description	In parameter	
	Out parameter	
Return value	Text background color	
Supplementary description		

8.2.10 gui_set_color

Function prototype	void gui_set_color(int color);	
Function function	Set the foreground color	
Parameter description	In parameter	color :the foreground color
	Out parameter	

Return value	
Supplementary description	

8.2.11 gui_get_color

Function prototype	void gui_get_color();	
Function function	Get the foreground color	
Parameter description	In parameter	
	Out parameter	
Return value	the foreground color	
Supplementary description		

8.2.12 gui_set_bg_color

Function prototype	void gui_set_bg_color(int color);	
Function function	Set the background color	
Parameter description	In parameter	color : the background color

	Out parameter	
Return value		
Supplementary description		

8.2.13 gui_get_bg_color

Function prototype	void gui_get_bg_color();	
Function function	Get the background color	
Parameter description	In parameter	
	Out parameter	
Return value	the background color	
Supplementary description		

8.2.14 gui_clear_dc

Function prototype	void gui_clear_dc(void);

Function function	Clear screen display	
Parameter description	In parameter	
	Out parameter	
Return value		
Supplementary description		

8.2.15 gui_set_pixel

Function prototype	int gui_set_pixel(int x, int y, int color);		
Function function	Draw on the screen		
Parameter description	In parameter	x y color	x coordinate y coordinate Point color
	Out parameter		

Return value	0 success
Supplementary description	

8.2.16 gui_pixel

Function prototype	int gui_pixel(int x, int y);		
Function function	Draw a point		
Parameter description	In parameter	x y	x coordinate y coordinate
	Out parameter		
Return value	0, success Other, failure		
Supplementary description			

8.2.17 gui_get_pixel

Function prototype	int gui_get_pixel(int x, int y);	
Function function	The color of the point on the screen	
Parameter description	In parameter	x x coordinate y y coordinate
	Out parameter	
Return value	Point color	
Supplementary description		

8.2.18 gui_text_out

Function prototype	int gui_text_out(int x, int y, char * text);	
Function function	Display text on the screen， Show only English	
Parameter description	In parameter	x x coordinate y y coordinate text Text content
	Out parameter	

Return value	0	success
Supplementary description		

8.2.19 gui_text_out_ex

Function prototype	int gui_text_out_ex(int x, int y, char * text);	
Function function	Display text on the screen , Display different languages	
Parameter description	In parameter	Parameter description
	Out parameter	
Return value	0	success
Supplementary description		

8.2.20 gui_get_text_width

Function prototype	int gui_get_text_width(char *text);	
Function function	Get the display width of the text	
Parameter description	In parameter	text Text content
	Out parameter	
Return value		
Supplementary description		

8.2.21 gui_get_text_height

Function prototype	int gui_get_text_height(char *text);	
Function function	Get the display height of the text	
Parameter description	In parameter	text Text content
	Out parameter	

Return value	Text height
Supplementary description	

8.2.22 gui_cline

Function prototype	void gui_cline(int x1, int y1, int x2, int y2, int color);	
Function function	Draw line	
Parameter description	In parameter	x1 Point 1 X coordinate x2 Point 2 X coordinate y1 Point 1 Y coordinate y2 Point 2 Y coordinate color Line color
	Out parameter	
Return value		
Supplementary description		

8.2.23 gui_line_to

Function prototype	void gui_line_to(int x, int y);	
Function function	Draw line	
Parameter description	In parameter	x :x coordinate y: y coordinate
	Out parameter	
Return value		
Supplementary description		

8.2.24 gui_get_width

Function prototype	int gui_get_width(void);	
Function function	Get screen width	
Parameter description	In parameter	

	Out parameter	
Return value	Screen width	
Supplementary description		

8.2.25 gui_get_height

Function prototype	xxx	
Function function	int gui_get_height(void);	
Parameter description	In parameter	
	Out parameter	
Return value	Screen height	
Supplementary description		

8.2.26 gui_page_op_paint

Function prototype	void gui_page_op_paint(char * left_str, char * right_str);	
Function function	Display characters at the bottom left and bottom of the screen	
Parameter description	In parameter	left_str The character displayed in the lower left corner right_str The character displayed in the lower right corner
	Out parameter	
Return value		
Supplementary description		

8.2.27 gui_ime_set_mode

Function prototype	int gui_ime_set_mode(int def_mode, int allow_mode, int password);	
Function function	Set input method parameters	
Parameter description	In parameter	def_mode Default input method allow_mode Support input method

		password enter password
	Out parameter	
Return value		
Supplementary description		

8.2.28 gui_ime_start_input

Function prototype	int gui_ime_start_input(char * buffer, int max, int * position, char * help);	
Function function	Open the input method page	
Parameter description	In parameter	buffer Input buffer max Maximum input character position Cursor position help Enter page title
	Out parameter	
Return value	Input length	

Supplementary description	

8.2.29 gui_main_menu_func_add

Function prototype	int gui_main_menu_func_add(void * pfunc);	
Function function	Add menu handler	
Parameter description	In parameter	pfunc Menu handler
	Out parameter	
Return value	0 success	
Supplementary description		

8.2.30 gui_main_menu_item_add

Function prototype	int gui_main_menu_item_add(st_gui_menu_item_def * menu_item);
Function function	Add menu item

Parameter description	In parameter	menu_item Menu data
	Out parameter	
Return value	0 success	
Supplementary description		

8.2.31 gui_main_menu_show

Function prototype	void gui_main_menu_show(char *id , int timeover);	
Function function	Display menu	
Parameter description	In parameter	id menu id timeover overtime time
	Out parameter	
Return value		

Supplementary description	

8.2.32 gui_post_message

Function prototype	unsigned int gui_post_message(unsigned int msg_id, unsigned int wparam, unsigned int lparam);	
Function function	Send a message	
Parameter description	In parameter	msg_id Message id wparam parameter 1 lparam parameter 2
	Out parameter	
Return value	0 success	
Supplementary description		

8.2.33 gui_proc_default_msg

Function prototype	int gui_proc_default_msg(st_gui_message * pmsg);
Function function	Let the system process the default message

Parameter description	In parameter	pmsg Message structure
	Out parameter	
Return value	0 success	
Supplementary description		

8.2.34 gui_messagebox_show

Function prototype	int gui_messagebox_show(char *title, char *msg , char* pszLeftOp, char* pszRightOp , int timeover);	
Function function	Display dialog	
Parameter description	In parameter	title Message title msg Message content pszLeftOp Bottom left corner pszRightOp Tip in the lower right corner timeover overtime time
	Out parameter	

Return value	1 2 3	Confirm return Cancel back Timeout
Supplementary description		

8.2.35 gui_load_bmp

Function prototype	char * gui_load_bmp(char * filename , int *width , int *height);	
Function function	Load bmp into memory	
Parameter description	In parameter	filename Image name
	Out parameter	width Image width height Picture height
Return value	Image content array, which needs to be released after use	
Supplementary description		

8.2.36 gui_out_bits

Function prototype	void gui_out_bits(int x, int y, unsigned char *pbits, int width , int height, int mode);	
Function function	display image	
Parameter description	In parameter	x X coordinate y Y coordinate pbits Image data width Image width height Picture height
	Out parameter	
Return value		
Supplementary description	Show attention to release pbits	

8.2.37 gui_out_bits_ex

Function prototype	void void gui_out_bits_ex(int x, int y, unsigned char *pbits, int width , int height, int mode , int color);	
Function function	display image	
Parameter description	In parameter	x X coordinate y Y coordinate pbits Image data width Image width height Picture height mode Positive display, 1 Reverse

		display color Bit color of the picture(1,4,24)
	Out parameter	
Return value		
Supplementary description	Show attention to release pbits	

8.2.38 gui_text_width_ex

Function prototype	int gui_text_width_ex(char * str);	
Function function	get text width	
Parameter description	In parameter	str: text
	Out parameter	
Return value	text width	
Supplementary description		

8.2.39 gui_settextstyle

Function prototype	void gui_settextstyle(int textStyle);		
Function function	Setting Text Styles		
Parameter description	In parameter	textStyles	textStyle = 0 opaque, textStyle = 1 transparent
	Out parameter		
Return value			
Supplementary description			

8.2.40 gui_begin_batch_paint

Function prototype	void void gui_begin_batch_paint();	
Function function	Batch refresh starts	
Parameter description	In parameter	
	Out parameter	

Return value	
Supplementary description	

8.2.41 gui_end_batch_paint

Function prototype	void gui_end_batch_paint();	
Function function	End of batch refresh	
Parameter description	In parameter	
	Out parameter	
Return value		
Supplementary description		
	Out parameter	
Return value	0, success Other, failure	
Supplementary description		

9 EMV(libapi_emv)

9.1 interface list

Function prototype	Function function
emv_read_card	EMV card trans.
EMV_TermConfigInit	Init terminal configure
EMV_GetKernelVersion	EMV kernel version
EMV_GetKernelData	TLV from EMV buffer.
EMV_PrmSetAIDPrm	Save AID buffer.
EMV_PrmGetAIDPrm	Get AID.
EMV_PrmDelAIDPrm	Delete specific AID
EMV_PrmClearAIDPrmFile	Clear all AID.
EMV_PrmSetCAPK	Save CAPK.
EMV_PrmGetCAPK	Get specific CAPK.
EMV_PrmDelCAPK	Delete specific CAPL.
EMV_PrmClearCAPKFile	Clear all CAPK.
EMV_GetDataByTag	Getting the specified tag value

9.2 API interface

9.2.1 emv_read_card

Function prototype	int emv_read_card(st_read_card_in *card_in, st_read_card_out *card_out);	
Function function	Process of emv card trans.	
Parameter description	In parameter	The parameter of EMV trans.

	Out parameter	Out buffer of EMV trans.
Return value	Result of emv trans.	
Supplementary description		

9.2.2 EMV_TermConfigInit

Function prototype	int EMV_TermConfigInit(const TERMCONFIG *ptermconfig);	
Function function	Init terminal configure of emv.	
Parameter description	In parameter	Terminal configure of emv.
	Out parameter	Null
Return value	Result of init terminal configure.	
Supplementary description		

9.2.3 EMV_GetKernelVersion

Function prototype	void EMV_GetKernelVersion(char *KernelVersion, int size);

Function function	Get emv kernel version	
Parameter description	In parameter	Length of version buffer.
	Out parameter	Kernel Version
Return value	Null	
Supplementary description		

9.2.4 **EMV_GetKernelData**

Function prototype	int EMV_GetKernelData (char *Tag, int *Len, byte *Value);	
Function function	Get TLV from EMV buffer.	
Parameter description	In parameter	Tag
	Out parameter	Length Value
Return value	Result of get TLV data.	
Supplementary description		

9.2.5 EMV_PrmSetAIDPrm

Function prototype	int EMV_PrmSetAIDPrm(TERMINALAPPLIST *pTerminalApps);	
Function function	Set AID buffer into device.	
Parameter description	In parameter	Aid buffer.
	Out parameter	Null
Return value	Result of set aid.	
Supplementary description		

9.2.6 EMV_PrmGetAIDPrm

Function prototype	int EMV_PrmGetAIDPrm(TERMINALAPPLIST *pTerminalApps);	
Function function	Get all aid into memory.	
Parameter description	In parameter	Null
	Out parameter	The AID buffer

Return value	Result of get aid buffer.
Supplementary description	

9.2.7 EMV_PrmDelAIDPrm

Function prototype	int EMV_PrmDelAIDPrm(byte *AID, byte AID_Len);	
Function function	Delete the specific AID.	
Parameter description	In parameter	AID Length of AID
	Out parameter	Null
Return value	Result of Delete.	
Supplementary description		

9.2.8 EMV_PrmClearAIDPrmFile

Function prototype	int EMV_PrmClearAIDPrmFile(void);
Function function	Clear all AID from device.

Parameter description	In parameter	Null
	Out parameter	Null
Return value	Result of clear AID.	
Supplementary description		

9.2.9 EMV_PrmSetCAPK

Function prototype	int EMV_PrmSetCAPK(CAPUBLICKEY *ppkKey);	
Function function	Save CAPK into device.	
Parameter description	In parameter	CPAK
	Out parameter	Null
Return value	Result of save CAPK.	
Supplementary description		

9.2.10 EMV_PrmGetCAPK

Function prototype	int EMV_PrmGetCAPK(CAPUBLICKEY *ppkKey, byte *RID, byte PKIndex);	
Function function	Get the specific index of CAPK.	
Parameter description	In parameter	RID of CAPK Index of CAPK
	Out parameter	CAPK
Return value	Result of get CAPK.	
Supplementary description		

9.2.11 EMV_PrmDelCAPK

Function prototype	int EMV_PrmDelCAPK(byte *RID, byte PKIndex);	
Function function	Delete the specific index of CAPK.	
Parameter description	In parameter	RID of CAPK Index of CAPK
	Out parameter	Null
Return value	Result of delete.	
Supplementary description		

9.2.12 EMV_PrmClearCAPKFile

Function prototype	int EMV_PrmClearCAPKFile(void);	
Function function	Clear all CAPK from device.	
Parameter description	In parameter	Null
	Out parameter	Null
Return value	Result of clear.	
Supplementary description		

9.2.13 EMV_GetDataByTag

Function prototype	int EMV_GetDataByTag(byte *psTag, byte *psSrc, int nSrcLen,byte *psBuf, int *nBufLen);	
Function function	Getting the specified tag value from the resource data.	
Parameter description	In parameter	psTag:Afferent tag psSrc:Resource data nSrcLen:Resource data length
	Out parameter	psBuf:Returns the tag value nBufLen:Returns the length of the tag value

Return value	0 Success, 1 Failure.
Supplementary description	

10 Print (libapi_print)

10.1interface list

Function prototype	Function function
UPrint_GetModuleVer	Get version number of print class module
UPrint_Init	Initialize, check the printer status (if it is out of paper), set the print font, use before printing
UPrint_Str	String printing with automatic line break function, support \r, \n newline
UPrint_BitMap	Picture printing
UPrint_Start	Start printing
UPrint_StrBold	String printing (UPrint_StrBold) with automatic line feed function, support \r, \n newline
UPrint_Feed	Printer paper feeding
UPrint_MatrixCode	Print QR code

10.2API interface

10.2.1 UPrint_GetModuleVer

Function prototype	int UPrint_GetModuleVer(char *pszVer);	
Function function	Get version number of print class module	
Parameter description	In parameter	Nothing
	Out parameter	pszVer Module version number
Return value	> 0 Successfully returns module version number length USYS_FAIL = -1	
Supplementary description		

10.2.2 UPrint_Init

Function prototype	int UPrint_Init(void);	
Function function	Initialize, check the printer status (if it is out of paper), set the print font, use before printing.	
Parameter description	In parameter	Nothing

	Out parameter	Nothing
Return value	UPRN_FILE_FAIL UPRN_OUTOF_PAPER UPRN_DEV_FAIL UPRN_FAIL UPRN_SUCCESS	Fail to open the file The printer is out of paper Printer device failure Printer unknown fault Success
Supplementary description		

10.2.3 UPrint_Str

Function prototype	int UPrint_Str(char *str, byte attrib, int linegap, byte newline);	
Function function	String printing with automatic line break function, support \r, \n newline	
Parameter description	In parameter	str: Need to print string information attrib: Font size: 0 small, 1 medium, 2 large linegap: Line spacing: unit pixels, 0 is the default value (for Pin printing use) newline: 0 Does not support line breaks;1 support \r, \n newline
	Out parameter	Nothing
Return value	UPRN_CACHE_ERR UPRN_SUCCESS	Save cache failed Success
Supplementary description		

10.2.4 UPrint_BitMap

Function prototype	int UPrint_BitMap(char *BmpFile,byte pattern);	
Function function	Picture printing	
Parameter description	In parameter	BmpFile: Image file name（XXX.bmp） pattern: Alignment: 0 left alignment, 1 center alignment, 2 right alignment
	Out parameter	Nothing
Return value	UPRN_CACHE_ERR Save cache failed UPRN_SUCCESS Success	
Supplementary description		

10.2.5 UPrint_Start

Function prototype	int UPrint_Start(void);	
Function function	Start printing	
Parameter description	In parameter	Nothing
	Out parameter	Nothing

Return value	UPRN_HANDLE_BACK Split machine handle is not put back UPRN_FILE_FAIL Fail to open the file UPRN_LOSE_COMMAND Print handle not obtained UPRN_OUTOF_PAPER The printer is out of paper UPRN_DEV_FAIL Printer device failure UPRN_FAIL Printer unknown fault UPRN_SUCCESS Success
Supplementary description	

10.2.6 UPrint_StrBold

Function prototype	int UPrint_StrBold(char *pszStr, byte cAttrib, byte cPattern,int nLinegap, byte newline);	
Function function	String printing with automatic line feed function, support \r, \n newline	
Parameter description	In parameter	pszStr: Need to print string information cAttrib: Font size: 0 small, 1 medium, 2 large cPattern: Print position: 0 left, 1 center, 2 right nlinegap: Line spacing, unit pixels, 0 is the default value (for Pin printing use) newline: 0 Does not support line breaks;1 support \r, \n newline
	Out parameter	Nothing
Return value	UPRN_CACHE_ERR Save cache failed UPRN_SUCCESS Success	

Supplementary description	

10.2.7 UPrint_Feed

Function prototype	int UPrint_Feed(int nFeedLines);	
Function function	Printer paper feeding	
Parameter description	In parameter	nFeedLines Paper length (pixels)
	Out parameter	Nothing
Return value	UPRN_CACHE_ERR Save cache failed UPRN_SUCCESS Success	
Supplementary description		

10.2.8 UPrint_MatrixCode

Function prototype	int UPrint_MatrixCode(const char *psMatrixCode, int nLen,byte cSize,byte cPattern);	
Function function	Print QR code （UPrint_MatrixCode） ,Convert incoming data to QR code and print	
Parameter description	In parameter	psMatrixCode: QR code data nLen: QR code data length cSize: QR code size, 0-small,

		1-medium, 2-large cPattern: Alignment, 0 left alignment, 1 center alignment, 2 right alignment
	Out parameter	Nothing
Return value	UPRN_CACHE_ERR Save cache failed UPRN_SUCCESS Success	
Supplementary description		