



Fujian MoreFun Electronic Technology Co.,Ltd.

MFSDK API

V1.6

Fujian MoreFun Electronic Technology Co.,Ltd.

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Document history version

Date	Version	Remark	Author
2025-04-02	V1.6	1. update to MFSDK V1.7.4	MoreFun SDK group
2024-05-31	V1.5	1. Added MfSdkFsRmdir 2. Added MfSdkFsOpenDir 3. Added MfSdkFsReadDir 4. Added MfSdkFsCloseDir	MoreFun SDK group
2024-05-31	V1.4	1.Add APIs description	MoreFun SDK group
2024-02-20	V1.3	1.Add Pinpad-related apis	MoreFun SDK group
2024-02-20	V1.2	1. Added API MfSdkFsRenamePath and MfSdkFsGetFileLength 2. API MfSdkFsOpenadd descriptive information; 3. MfSdkLcdSetPowerDownTime input parameter unit second; 4. MfSdkCommSocketConnect input parameter timeout unit ms;	MoreFun SDK group
2024-02-17	V1.1	1.MfSdkCommAtcCpin add descriptive information; 2.MfSdkQrDecode modify the return value type; 3.Added MfSdkTmsSetSig API whether to enable the signature verification function; 4.Added MfSdkVerGetSecHwVer/MfSdkVerGetSecFwVer; 5.MfSdkPrtSetLineSpace;	MoreFun SDK group
2023-12-31	V1.0	First version	MoreFun SDK group

1 Global

1.1 Module description

The definition of the global description.

1.2 Module structure declaration

None.

1.3 Constant declarations

```
#define MFSDK_UNUSED(x) ((void)(x))
#define MFSDK_COND_RET(__cond__,__retValue__) do{ if(__cond__)
                                                { return __retValue__; } }while(0)

#define MFSDK_FALSE (0)
#define MFSDK_TRUE (1)

typedef int MFSDKBOOL;

typedef uint64_t u64;
typedef int64_t s64;
typedef unsigned int u32;
typedef signed int s32;
typedef unsigned short u16;
typedef signed short s16;
typedef unsigned char u8;
typedef signed char s8;

typedef enum
{
    MFSDK_RET_FAILED = -3, //failed
    MFSDK_RET_BOUNDS = -2, //Array out-of-bounds
    MFSDK_RET_PARM_ERROR = -1, //check param
    MFSDK_RET_OK = 0,
}MfSdkRet_E;
```

2 Version module

2.1 Module description

This module mainly includes APIs for getting versions.

2.2 Module structure declaration

None.

2.3 Constant declarations

None.

2.4 MfSdkVerGetDataVersion

Prototype		LIB_EXPORT s8* MfSdkVerGetDataVersion()
Function		Get data lib version
Params	in	Nothing
	out	Nothing
return		version string
remark		
demo		char* data_version = NULL; data_version = MfSdkVerGetDataVersion();

2.5 MfSdkVerMfOsVersion

Prototype		LIB_EXPORT s8* MfSdkVerMfOsVersion()
Function		Get MoreFun OS SDK version
Params	in	Nothing
	out	Nothing
return		version string
remark		
demo		char* osVersion = NULL; osVersion = MfSdkVerMfOsVersion();

2.6 MfSdkVerGetAppVer

Prototype	LIB_EXPORT const s8 *MfSdkVerGetAppVer()
Function	Get App version
Params	in Nothing
	out Nothing
return	version string
remark	
demo	char* appVersion = NULL; appVersion = MfSdkVerGetAppVer();

2.7 MfSdkVerGetBootVer

Prototype	LIB_EXPORT const s8 *MfSdkVerGetBootVer()
Function	Get boot version
Params	in Nothing
	out Nothing
return	version string
remark	
demo	char* bootVersion = NULL; bootVersion = MfSdkVerGetBootVer();

2.8 MfSdkVerGetDriverVer

Prototype	LIB_EXPORT const s8 *MfSdkVerGetDriverVer()
Function	Get driver version
Params	in Nothing
	out Nothing
return	version string

remark	
demo	char* driverVersion = NULL; driverVersion = MfSdkVerGetDriverVer();

2.9 MfSdkVerGetSysVer

Prototype	LIB_EXPORT const s8 *MfSdkVerGetSysVer()				
Function	Get system version				
Params	<table border="1"> <tr> <td>in</td> <td>Nothing</td> </tr> <tr> <td>out</td> <td>Nothing</td> </tr> </table>	in	Nothing	out	Nothing
in	Nothing				
out	Nothing				
return	version string				
remark					
demo	char* sysVersion = NULL; sysVersion = MfSdkVerGetSysVer();				

2.10 MfSdkVerGetSpVer

Prototype	LIB_EXPORT const s8 *MfSdkVerGetSpVer()				
Function	Get sp version				
Params	<table border="1"> <tr> <td>in</td> <td>Nothing</td> </tr> <tr> <td>out</td> <td>Nothing</td> </tr> </table>	in	Nothing	out	Nothing
in	Nothing				
out	Nothing				
return	version string				
remark					
demo	char* spVersion = NULL; spVersion = MfSdkVerGetSpVer();				

2.11 MfSdkVerSetAppVersion

Prototype	LIB_EXPORT s32 MfSdkVerSetAppVersion(s8 *pszVer)
------------------	--

Function		Set application version.	
Params	in	pszVer	app version string
	out	Nothing	
return		0	Success
remark			
demo		char* appVer = "V1.0.0"; MfSdkVerSetAppVersion(appVer);	

2.12 MfSdkVerGetSecHwVer

Prototype		LIB_EXPORT s8 *MfSdkVerGetSecHwVer()
Function		get pci hardware version
Params	in	Nothing
	out	Nothing
return		version string
remark		
demo		char *ver = (char*)MfSdkVerGetSecHwVer();

2.13 MfSdkVerGetSecFwVer

Prototype		LIB_EXPORT s8 *MfSdkVerGetSecFwVer()
Function		Get pci firmware version
Params	in	Nothing
	out	Nothing
return		version string
remark		
demo		char *ver = (char*)MfSdkVerGetSecFwVer();

3 Util module

3.1 Module description

This module mainly includes encoding type conversion and other util APIs.

3.2 Module structure declaration

```
//QR code parameters
typedef struct
{
    s32 nVersion;      //< version number:1~40
    s32 nLevel;       //< Error correction level: 0-low, 1-in, 2-high, 3-maximum
    s32 moudleWidth;  //< Module width (unit: pixel)
} MfSdkUtilQrlInfo_T;
```

3.3 Constant declarations

```
typedef enum
{
    MFSDK_UTIL_RET_FAILED = -3, //failed
    MFSDK_UTIL_RET_BOUNDS = -2, //Array out-of-bounds
    MFSDK_UTIL_RET_PARM_ERROR = -1, //check param
    MFSDK_UTIL_RET_OK = 0,
}MfSdkUtilRet_E;

typedef enum {
    MFSDK_UTIL_MD_SHA1,        /**< The SHA-1 message digest. */
    MFSDK_UTIL_MD_SHA256,      /**< The SHA-256 message digest. */
    MFSDK_UTIL_MD_SHA512,      /**< The SHA-512 message digest. */
} MfSdkUtilMDType_E;
```

3.4 MfSdkUtilGetModuleVer

Prototype	LIB_EXPORT s32 MfSdkUtilGetModuleVer(s8 *pszVer)	
Function	Get util module version	
Params	in	Nothing
	out	pszVer Module version
return	Others	Failed, Ref. <u>MfSdkUtilRet_E</u>

	MFSDK_UTIL_RET_Success OK
remark	
demo	<pre>char utilVersion[20] = {0}; int ret = -1; ret = MfSdkUtilGetModuleVer(utilVersion);</pre>

3.5 MfSdkUtilAsc2Bcd

Prototype	LIB_EXPORT s32 MfSdkUtilAsc2Bcd(s8 *AscBuf, s8 *BcdBuf, s32 AscLen)	
Function	ASCII code to BCD code	
Params	in	AscLen Incoming ASCII code data length
		AscBuf ASCII code data to be converted
	out	BcdBuf Conversion output BCD code data
return	Others	Failed, Ref. <u>MfSdkUtilRet_E</u>
		MFSDK_UTIL_RET_Success OK
remark		
demo	<pre>char *AscBuf = "1234"; char BcdBuf[3] = {0}; int ret = -1; ret = MfSdkUtilAsc2Bcd(AscBuf, BcdBuf, strlen(AscBuf));</pre>	

3.6 MfSdkUtilBcd2Asc

Prototype	LIB_EXPORT s32 MfSdkUtilBcd2Asc(s8 *BcdBuf, s8 *AscBuf, s32 AscLen)	
Function	BCD code to ASCII code	
Params	in	AscLen The length of ASCII code data, that is the double length of BCD code data
		BcdBuf BCD code data to be converted
	out	AscBuf Conversion output ASCII code data
return	Others	Failed, Ref. <u>MfSdkUtilRet_E</u>
		MFSDK_UTIL_RET_Success

	OK
remark	
demo	<pre>char AscBuf[9] = {0}; char *BcdBuf = "\x12\x23"; int ret = -1; ret = MfSdkUtilBcd2Asc(BcdBuf, AscBuf, 2); APP_TRACE("MfSdkUtilBcd2Asc:%s\r\n",AscBuf); Result: MfSdkUtilBcd2Asc:12</pre>

3.7 MfSdkUtilHex2Asc

Prototype	LIB_EXPORT s32 MfSdkUtilHex2Asc(u8* pszBcdBuf, s32 AscLen, s8 cAlignment, u8* pszAsciiBuf)	
Function	Hex code to ASCII code	
Params	in	AscLen The length of ASCII code data, that is the double length of Bcd code data
		cAlignment Alignment
		pszBcdBuf Bcd code data to be converted
	out	AscBuf Conversion output ASCII code data
return	Others	Failed
	MFSK.Util.RET_Success OK	
remark		
demo	<pre>char AscBuf[9] = {0}; char *BcdBuf = "\x12\x23"; int ret = -1; memset(AscBuf,0,sizeof(AscBuf)); MfSdkUtilHex2Asc(BcdBuf, 4, 1, AscBuf); APP_TRACE("MfSdkUtilHex2Asc1:%s\r\n",AscBuf); memset(AscBuf,0,sizeof(AscBuf)); MfSdkUtilHex2Asc(BcdBuf, 4, 0, AscBuf); APP_TRACE("MfSdkUtilHex2Asc2:%s\r\n",AscBuf); memset(AscBuf,0,sizeof(AscBuf)); MfSdkUtilHex2Asc(BcdBuf, 3, 1, AscBuf); APP_TRACE("MfSdkUtilHex2Asc3:%s\r\n",AscBuf); memset(AscBuf,0,sizeof(AscBuf)); MfSdkUtilHex2Asc(BcdBuf, 3, 0, AscBuf); APP_TRACE("MfSdkUtilHex2Asc4:%s\r\n",AscBuf); Result:</pre>	

	MfSdkUtilHex2Asc1:1223 MfSdkUtilHex2Asc2:1223 MfSdkUtilHex2Asc3:223 MfSdkUtilHex2Asc4:122
--	--

3.8 MfSdkUtilInt2Bcd

Prototype	LIB_EXPORT s32 MfSdkUtilInt2Bcd(u32 IntData, s8 *BcdBuf, s32 BcdLen)	
Function	Int data transfer to BCD code	
Params	in	BcdLen Length of BCD code data after conversion
		IntData Int data to be converted
	out	BcdBuf BCD data after conversion
return	Others	Failed, Ref. MfSdkUtilRet_E
	MFSDK_UTIL_RET	Success OK
remark		
demo	<pre>s8 bcdbuf[16] = {0}; MfSdkUtilInt2Bcd(123,bcdbuf, 2); APP_TRACE_BUFF_TIP(bcdbuf, 2, "MfSdkUtilInt2Bcd1"); memset(bcdbuf,0,sizeof(bcdbuf)); MfSdkUtilInt2Bcd(123,bcdbuf, 4); APP_TRACE_BUFF_TIP(bcdbuf, 4, "MfSdkUtilInt2Bcd4"); Result: MfSdkUtilInt2Bcd1 01 23 MfSdkUtilInt2Bcd4 00 00 01 23</pre>	

3.9 MfSdkUtilBcd2Int

Prototype	LIB_EXPORT s32 MfSdkUtilBcd2Int(s8 *BcdBuf, u32 *IntData,s32 BcdLen)	
Function	BCD code to int type	
Params	in	BcdLen BCD code data length
		BcdBuf BCD data to be converted

	out	IntData	Int data after conversion	
		Others	Failed, Ref. MfSdkUtilRet_E	
	return	MFSDK_UTIL_RET_OK	Success	
	remark			
	demo	<pre>u32 IntData = 0; char *BcdBuf = "\x12\x23"; int ret = -1; ret = MfSdkUtilBcd2Int(BcdBuf, &IntData, 2); APP_TRACE("MfSdkUtilBcd2Int:%d\r\n", IntData); Result: MfSdkUtilBcd2Int:1223</pre>		

3.10 MfSdkUtilGenLrc

Prototype		LIB_EXPORT u8 MfSdkUtilGenLrc(s8 *Data, s32 DataLen)		
Function		Calculates LRC and generates LRC parity bits (bitwise exclusive or)		
Params	in	Data	Data to be calculated for LRC check bits	
		DataLen	Data length	
return		LRC	The LRC check value generated by calculation	
remark				
demo		<pre>char* Data = "xxxxxxxxxx"; unsigned char LRC; LRC = MfSdkUtilGenLrc(Data, strlen(Data));</pre>		

3.11 MfSdkUtilDes

Prototype		LIB_EXPORT s32 MfSdkUtilDes(u8 bDesType, u8 bDesMode, s8 *Key, s8 *InData, s32 DataLen, s8 *OutData)	
Function		DES encryption and decryption to DES data encryption and decryption, or 3DES encryption and decryption	
Params	in	bDesType	DES encryption and decryption algorithm: 0 denotes DES encryption, 1 denotes DES decryption, 2 denotes 3DES encryption(16 bytes key), 3 denotes 3DES decryption(16 bytes key),

		4 denotes 3DES encryption(24 bytes key), 5 denotes 3DES decryption(24 bytes key).
	bDesMode	0 ECB 1 CBC
	Key	Used for encryption and decryption of transmission keys, must be 8 times
	InData	Input data to be encrypted or decrypted must be 8 times bytes
	DataLen	The length of input data
out	OutData	The key after encryption and decryption must be 8 bytes
return	Others	Failed, Ref. MfSdkUtilRet_E
	MFSDK_UTIL_RET_	OK Success
remark		
demo		

3.12 MfSdkUtilBeep

Prototype	LIB_EXPORT void MfSdkUtilBeep(s32 num)		
Function	Buzzing success indicates buzzing when successful, non blocking		
Params	in	num	Buzz times
return	Nothing		
remark			
demo	MfSdkUtilBeep(100);		

3.13 MfSdkUtilBuzzerSound

Prototype	LIB_EXPORT void MfSdkUtilBuzzerSound(s32 nMillisecond)		
Function	Set the buzzer ringing time		
Params	in	nMillisecond	ringing time(Unit millisecond)
	out	Nothing	
return	Nothing		

remark	
demo	MfSdkUtilBuzzerSound(100);

3.14 MfSdkUtilGetRand

Prototype	LIB_EXPORT s32 MfSdkUtilGetRand(s32 len, u8* pBuf)		
Function	Generating random numbers		
Params	in	len	random number len
	out	pBuf	random number string
return		Others	Failed, Ref. MfSdkUtilRet_E
		MFSDK_UTIL_RET_OK	Success
remark			
demo	<pre>unsigned char randomNumberStr[6] = {0}; int ret = -1; ret = MfSdkUtilGetRand(5, randomNumberStr);</pre>		

3.15 MfSdkUtilSHA1

Prototype	LIB_EXPORT s32 MfSdkUtilSHA1(const u8* psSrc, u32 nSrcLen, u8* psDst)		
Function	SHA1 calculation		
Params	in	psSrc	Source buffer
		nSrcLen	Source length
	out	psDst	Result of SHA1
return		Others	Failed, Ref. MfSdkUtilRet_E
		MFSDK_UTIL_RET_OK	Success
remark			
demo	<pre>unsigned char* psSrc = "demotest"; unsigned char psDst[20+1] = {0}; int ret = -1; ret = MfSdkUtilSHA1((const unsigned char*)psSrc, strlen(psSrc), psDst);</pre>		

3.16 MfSdkUtilGeneCodePic

Prototype	LIB_EXPORT s32 MfSdkUtilGeneCodePic(s8 * chData, s32 iLen, MfSdkUtilQrInfo_T *qrparam , s8 * bitmap)
Function	QR code generation
Params	in chData QR code data
	iLen Data length
	qrparam QR code parameters
	out bitmap Generated two-dimensional code dot matrix data
return	Others Failed, Ref. MfSdkUtilRet_E
	>0 Successfully generated QR code width
remark	
demo	<pre>#define QR_HEIGHT 80 MfSdkUtilQrInfo_T qrparam; char *bitmap = MALLOC(QR_HEIGHT*QR_HEIGHT/8); char *qrData = "http://en.morefun-et.com"; int length = strlen(qrData); int width = 0; int Qr_width = MfSdkUtilGetWidth(); qrparam.nVersion = 0; //auto qrparam.nLevel = 0; qrparam.moduleWidth = 1; while(qrparam.moduleWidth > 0 && (width <= 0 width > Qr_width)) { memset(bitmap, 0, QR_HEIGHT*QR_HEIGHT/8); width = MfSdkUtilGeneCodePic(data, length, &qrparam, bitmap); qrparam.moduleWidth--; }</pre>

3.17 MfSdkUtilLed

Prototype	LIB_EXPORT void MfSdkUtilLed(s32 num, s32 type)
Function	LED light control

Params	in	num	LED light number (0 red, 1 blue, 2 yellow, 3 green)
		type	LED light switch(0 close, 1 open)
	out	Nothing	
	return	Nothing	
	remark		
	demo	MfSdkUtilLed(1,1); // open blue led	

3.18 MfSdkUtilStr2Longlong

Prototype	LIB_EXPORT long long MfSdkUtilStr2Longlong(const s8 *amt)		
Function	String to long long		
Params	in	amt	amount string
	out	Nothing	
	return	long long	amount in long long type
	remark		
	demo	char *amt = "1533352"; long long amt = MfSdkUtilStr2Longlong((const char*)amt);	

3.19 MfSdkUtilMd5File

Prototype	LIB_EXPORT s32 MfSdkUtilMd5File(const s8* pszFilePath, u8* pOutMD5)		
Function	File MD5 value calculation		
Params	in	pszFilePath	File Path
	out	pOutMD5	MD5 result
	return	MFSRK_FALSE	file not found
		MFSRK_TRUE	success
	remark		
	demo	#define FILE_TEST "data\\test.txt" unsigned char *pOutMD5 = NULL; int ret = MfSdkUtilMd5File(FILE_TEST, pOutMD5);	

3.20 MfSdkUtilUtf8str2Astr

Prototype		LIB_EXPORT s32 MfSdkUtilUtf8str2Astr(char *utfstr, s32 utfchars, u8*astr,s32 buffsize)		
Function		Utf-8 string to ASCII string		
Params	in	utfstr	utf-8 string	
		utfchars	utf-8 string length	
		buffsize	astr buffer size	
	out	astr	out ascii string	
return		Others	Failed, Ref. MfSdkUtilRet_E	
		>0	ascii length	
remark				
demo		<pre>char AscBuf[50] = {0}; char *utfstr= "test"; int ret = -1; ret = MfSdkUtilUtf8str2Astr(utfstr, strlen(utfstr), AscBuf, sizeof(AscBuf));</pre>		

3.21 MfSdkUtilUnicodeToUtf8

Prototype		LIB_EXPORT s32 MfSdkUtilUnicodeToUtf8(u16 codepoint, s8 *outstr)		
Function		Unicode data transfer to utf-8 code		
Params	in	codepoint	Unicode data to be converted	
	out	outstr	utf-8 data after conversion	
return		Others	Failed, Ref. MfSdkUtilRet_E	
		>0	The length of outstr	
remark				
demo		<pre>char utfstr[50] = {0}; char *unicode= "test"; int utflen= -1; utflen = MfSdkUtilUnicodeToUtf8((unsigned short)unicode, utfstr);</pre>		

3.22 MfSdkUtilUtf8ToUnicode

Prototype		LIB_EXPORT s32 MfSdkUtilUtf8ToUnicode(u8 *instr, u8 *outstr)	
Function		utf-8 code data transfer to Unicode	
Params	in	instr	utf-8 data to be converted
	out	outstr	Unicode data after conversion
return	Others	Failed, Ref. MfSdkUtilRet_E	
	>0	The length of outstr	
remark			
demo		<pre>char unicodestr[50] = {0}; char *utfstr= "test"; int unilen= -1; unilen = MfSdkUtilUtf8ToUnicode(utfstr, unicodestr);</pre>	

3.23 MfSdkUtilTlvGetDataByTag

Prototype		LIB_EXPORT s32 MfSdkUtilTlvGetDataByTag(u8*tagName,u8 *pInBuf,s32 inBufLength,u8 *pValue, s32 valueLength)	
Function		Get TLV data by tag	
Params	in	tagName	tag name eg. "\x9F\x02"
		pInBuf	tlv bytes stream
		inBufLength	tlv bytes stream length
		valueLength	pValue buffer size
out	pValue	tagName value	
	Others	Failed, Ref. MfSdkUtilRet_E	
return		>0	pValue length
remark			
demo			

3.24 MfSdkUtilCtrlBeep

Prototype	LIB_EXPORT void MfSdkUtilCtrlBeep(int ms, int hz)	
Function	Set the buzzer ringing time and Hz	
Params	in	ms beep time ms
		hz beep hz
	out	Nothing
return	Nothing	
remark		
demo	//750Hz ringing 500ms MfSdkUtilCtrlBeep(500,750);	

3.25 MfSdkUtilGenRsa

Prototype	LIB_EXPORT s32 MfSdkUtilGenRsa(s32 keyBits,u8 *privPem, s32 privPemLength,u8 *pubPem, s32 pubPemLength,s32 timeoutMs)	
Function	Generate RSA public and private keys. The exponent is fixed at 65537	
Params	in	keyBits RSA key bits
		privPemLength privPem buffer size
		pubPemLength pubPem buffer size
		timeoutMs timeout ms
	out	privPem private key, format is pem
		pubPem public key format is pem
return	Others	Failed, Ref. MfSdkUtilRet_E
	0	Success
remark		
demo		

3.26 MfSdkUtilGenRsaKey

Prototype	LIB_EXPORT s32 MfSdkUtilGenRsaKey(u8 index,s32 keyBits,s32 timeoutMs)
------------------	---

Function		Generate RSA key	
Params	in	index	index
		keyBits	1024 - 4096 bits
		timeoutMs	timeout ms
	out	Nothing	
return	0 Success		
	Other Failed, Ref. MfSdkUtilRet_E		
remark			
demo			

3.27 MfSdkUtilRsaSign

Prototype		LIB_EXPORT s32 MfSdkUtilRsaSign(u8 index ,MfSdkUtilMDType_E mdAlg, u8* hash , s32 hashLength,u8* signData,s32 signDataLength)	
Function		Generate RSA signature	
Params	in	index	
		mdAlg	Ref. MfSdkUtilMDType_E
		hash	
	out	hashLength	
return	signData		
	signDataLength		
return	Others	Failed, Ref. MfSdkUtilRet_E	
	>0	Success	
remark			
demo			

3.1 MfSdkUtilRsaGetPublicKey

Prototype		LIB_EXPORT s32 MfSdkUtilRsaGetPublicKey(u8 index , u8 *pubPem, s32 pubPemLength)
Function		Get RSA public key
Params	in	index

		pubPemLength
	out	pubPem key string
return	0	Success
	Others	Failed, Ref. MfSdkUtilRet_E
remark		
demo		

3.2 MfSdkUtilGenRsaDelKey

Prototype	LIB_EXPORT s32 MfSdkUtilGenRsaDelKey(u8 index)	
Function	Delete index RSA key	
Params	in	index
	out	Nothing
return	MFSDK_UTIL_RET_	Success OK
	Others	Failed, Ref. MfSdkUtilRet_E
remark		
demo		

3.3 MfSdkUtilGenRsaDelAllKey

Prototype	LIB_EXPORT s32 MfSdkUtilGenRsaDelAllKey(void)	
Function	Delete all RSA key	
Params	in	Nothing
	out	Nothing
return	MFSDK_UTIL_RET_	Success OK
	Others	Failed, Ref. MfSdkUtilRet_E
remark		
demo		

3.4 MfSdkUtilRsaRand

Prototype		LIB_EXPORT s32 MfSdkUtilRsaRand(void* para, u8* pbuf, u32 len)				
Function		For mbedtls rand				
Params	in	para				
		pbuf				
		len				
	out	Nothing				
return		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Others</td> <td style="width: 70%;">Failed, Ref. MfSdkUtilRet_E</td> </tr> <tr> <td>0</td> <td>Success</td> </tr> </table>	Others	Failed, Ref. MfSdkUtilRet_E	0	Success
Others	Failed, Ref. MfSdkUtilRet_E					
0	Success					
remark						
demo						

3.5 MfSdkUtilCompress

Prototype		LIB_EXPORT s32 MfSdkUtilCompress (u8*dest, u32 *destLen, const u8* source, u32 sourceLen)				
Function		Compresses the source buffer into the destination buffer. The level parameter has the same meaning as in deflateInit. sourceLen is the byte length of the source buffer. Upon entry, destLen is the total size of the destination buffer, which must be at least 0.1% larger than sourceLen plus 12 bytes. Upon exit, destLen is the actual size of the compressed buffer.				
Params	in	destLen				
		source				
		sourceLen				
	out	destLen				
		dest				
return		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Others</td> <td style="width: 70%;">Failed, Ref. MfSdkUtilRet_E</td> </tr> <tr> <td>MFSDK_UTIL_RET_OK</td> <td>Success</td> </tr> </table>	Others	Failed, Ref. MfSdkUtilRet_E	MFSDK_UTIL_RET_OK	Success
Others	Failed, Ref. MfSdkUtilRet_E					
MFSDK_UTIL_RET_OK	Success					
remark						
demo						

3.6 MfSdkUtilCompressBound

Prototype	LIB_EXPORT u32 MfSdkUtilCompressBound (u32 sourceLen)	
Function	get compress bound	
Params	in	sourceLen
	out	Nothing
return		compress bound value
remark		
demo		

3.7 MfSdkUtilSave2Zip

Prototype	LIB_EXPORT s32 MfSdkUtilSave2Zip(const char *zip_filename, const char *file_name_in_zip, const u8 *data, u32 data_len)	
Function	save data to zip file	
Params	in	zip_filename zip file name
		file_name_in_zip compress data file name
		data compress data
		data_len compress data length
	out	Nothing
return		Others Failed, Ref. MfSdkUtilRet_E MFSDK_UTIL_RET_Success OK
remark		
demo		

4 RFID module

4.1 Module description

This module mainly includes NFC APIs.

4.2 Module structure declaration

None.

4.3 Constant declarations

```

typedef enum
{
    MFSDK_NFC_RET_MUTILCARD = MFSDK_ICC_RET_MUTILCARD,
    // more than one card
    MFSDK_NFC_RET_NOCARD = MFSDK_ICC_RET_NOCARD, // dont
    find card
    MFSDK_NFC_RET_FAILED = MFSDK_ICC_RET_FAILED, //failed
    MFSDK_NFC_RET_BOUNDS = MFSDK_ICC_RET_BOUNDS, //Array
    out-of-bounds
    MFSDK_NFC_RET_PARM_ERROR =
    MFSDK_ICC_RET_PARM_ERROR, //check param
    MFSDK_NFC_RET_OK = 0,
}MfSdkNfcRet_E;

typedef enum
{
    MFSDK_NFC_LED_BLUE = 0,
    MFSDK_NFC_LED_YELLOW,
    MFSDK_NFC_LED_GREEN,
    MFSDK_NFC_LED_RED,
}MfSdkNfcLed_E;

typedef enum
{
    MFSDK_NFC_LED_OFF = 0,
    MFSDK_NFC_LED_ON = 1,
}MfSdkNfcLedSwitch_E;

```

4.4 MfSdkNfcInit

Prototype	LIB_EXPORT s32 MfSdkNfcInit(void)	
Function	Initialization of the NFC module.	
Params	in	None
	out	None

return	Others	Failed, Ref. MfSdkNfcRet_E
	MFSDK_NFC_RET_	Success
remark		
demo		

4.5 MfSdkNfcApdu

Prototype	LIB_EXPORT s32 MfSdkNfcApdu(u8 *tbuf, u16 tlen, u8 **rbuf, u16 *rlen)	
Function	NFC APDU exchange.	
Params	in	tbuf apdu request command
		tlen apdu request command length
	out	rbuf eg. unsigned char *pTemp &pTemp
		rlen pdu response length point
return	MFSDK_NFC_RET_FAIL	Failed, Ref. MfSdkNfcRet_E
	ED	
	MFSDK_NFC_RET_PAR	Invalid parameters.
remark		
demo	<pre>s32 iRet = MFSDK_NFC_RET_FAILED; u8 *pRApdu = NULL; u16 rApduLength = 0; u8 cApud[] = { 0x00,0xA4,0x04,0x00,0x0E,0x32,0x50,0x41, 0x59,0x2E,0x53,0x59,0x53,0x2E,0x44,0x44, 0x46,0x30,0x31,0x00 }; iRet = MfSdkNfcApdu(cApud,sizeof(cApud),&pRApdu , &rApduLength); if(MFSDK_NFC_RET_OK == iRet) { //Success TODO } else</pre>	

	{ //Fail }
--	------------------

4.6 MfSdkNfcClose

Prototype	LIB_EXPORT s32 MfSdkNfcClose(void)				
Function	Turn off the NFC module.				
Params	<table border="1"> <tr> <td>in</td> <td>None</td> </tr> <tr> <td>out</td> <td>None</td> </tr> </table>	in	None	out	None
in	None				
out	None				
return	<table border="1"> <tr> <td>Others</td> <td>Failed, Ref. MfSdkNfcRet_E</td> </tr> <tr> <td></td> <td>MFSDK_NFC_RET_OK Success</td> </tr> </table>	Others	Failed, Ref. MfSdkNfcRet_E		MFSDK_NFC_RET_OK Success
Others	Failed, Ref. MfSdkNfcRet_E				
	MFSDK_NFC_RET_OK Success				
remark					
demo					

4.7 MfSdkNfcCtlIsComm

Prototype	LIB_EXPORT s32 MfSdkNfcCtlIsComm(s32 iCardType,MfSdkIccApdu_T *Apdu)						
Function	NFC CtlIs command						
Params	<table border="1"> <tr> <td>in</td> <td>iCardType</td> </tr> <tr> <td></td> <td>Apdu</td> </tr> <tr> <td>out</td> <td>None</td> </tr> </table>	in	iCardType		Apdu	out	None
in	iCardType						
	Apdu						
out	None						
return	<table border="1"> <tr> <td>Others</td> <td>Failed, Ref. MfSdkNfcRet_E</td> </tr> <tr> <td></td> <td>MFSDK_NFC_RET_OK Success</td> </tr> </table>	Others	Failed, Ref. MfSdkNfcRet_E		MFSDK_NFC_RET_OK Success		
Others	Failed, Ref. MfSdkNfcRet_E						
	MFSDK_NFC_RET_OK Success						
remark							
demo							

4.8 MfSdkNfcCtlPowerDown

Prototype	LIB_EXPORT s32 MfSdkNfcCtlPowerDown(void)
------------------	---

Function	NFC CtIs Power Down	
Params	in	None
	out	None
return	Others	Failed, Ref. MfSdkNfcRet_E
	MFSDK_NFC_RET_OK	Success
remark		
demo		

4.9 MfSdkNfcCtIsPowerUpAndSeek

Prototype	LIB_EXPORT s32 MfSdkNfcCtIsPowerUpAndSeek(int iCardType, char *psUID)	
Function	NFC CtIs Power Up and seek	
Params	in	iCardType
		psUID
return	out	None
	Others	Failed, Ref. MfSdkNfcRet_E
remark	MFSDK_NFC_RET_OK Success	
demo		

4.10 MfSdkNfcDetect

Prototype	LIB_EXPORT s32 MfSdkNfcDetect(void)	
Function	Check the user whether tap card .	
Params	in	None
	out	None
return	Others	Failed, Ref. MfSdkNfcRet_E
	MFSDK_NFC_RET_NO_CARD	No card
	MFSDK_NFC_RET_MULTI_CARD	multiple card

	MFSDK_NFC_RET_OK Success
remark	
demo	

4.11 MfSdkNfcApduStream

Prototype		LIB_EXPORT s32 MfSdkNfcApduStream(u8 *pC_Apdu, s32 clen, u8 *pR_Apdu, s32 rlen)	
Function		Bytes stream apdu command	
Params	in	pC_Apdu	CAPDU bytes stream
		clen	CAPDU bytes stream length
		rlen	recv buffer size
	out	pR_Apdu	RAPDU recv buffer
return		Others	Failed, Ref. MfSdkNfcRet_E
		> 0	R_Apdu length
		MFSDK_ICC_RET_PARM_E RROR	params error
		MFSDK_ICC_RET_BOUNDS rlen < card response length	
remark			
demo			

4.12 MfSdkNfcGetUid

Prototype		LIB_EXPORT s32 MfSdkNfcGetUid(u8* uid)	
Function		Get card UID	
Params	in	uid	
	out	None	
return		Others	Failed, Ref. MfSdkNfcRet_E
		> 0	uid length
remark			
demo			

4.13 MfSdkNfcIsProbe

Prototype		LIB_EXPORT s32 MfSdkNfcIsProbe(void)	
Function		Check whether the NFC card is detected	
Params	in	None	
	out	None	
return	Others	Failed, Ref. MfSdkNfcRet_E	
	1	Success	
remark			
demo			

4.14 MfSdkNfcM1Atqa

Prototype		LIB_EXPORT s32 MfSdkNfcM1Atqa(void)	
Function			
Params	in	None	
	out	None	
return	Others	Failed, Ref. MfSdkNfcRet_E	
	MFSDK_NFC_RET_OK	Success	
remark			
demo			

4.15 MfSdkNfcM1Auth

Prototype		LIB_EXPORT s32 MfSdkNfcM1Auth(s32 cmd, s32 block)	
Function			
Params	in	cmd	

		block
	out	None
return	Others	Failed, Ref. MfSdkNfcRet_E
	MFSDK_NFC_RET_OK	Success
remark		
demo		

4.16 MfSdkNfcM1Close

Prototype	LIB_EXPORT s32 MfSdkNfcM1Close(void)	
Function		
Params	in	None
	out	None
return	Others	Failed, Ref. MfSdkNfcRet_E
	MFSDK_NFC_RET_OK	Success
remark		
demo		

4.17 MfSdkNfcM1Decrement

Prototype	LIB_EXPORT s32 MfSdkNfcM1Decrement(s32 block, s32 operand)	
Function		
Params	in	block
		operand
	out	None
return	Others	Failed, Ref. MfSdkNfcRet_E
	MFSDK_NFC_RET_OK	Success
remark		
demo		

4.18 MfSdkNfcM1Increment

Prototype	LIB_EXPORT s32 MfSdkNfcM1Increment(s32 block, s32 operand)				
Function					
Params	in	block			
		operand			
	out	None			
return	Others	Failed, Ref. MfSdkNfcRet_E			
	MFSDK_NFC_RET_OK	Success			
remark					
demo					

4.19 MfSdkNfcM1Open

Prototype	LIB_EXPORT s32 MfSdkNfcM1Open(void)				
Function	M1 open				
Params	in	None			
		None			
	out				
return	Others	Failed, Ref. MfSdkNfcRet_E			
	MFSDK_NFC_RET_OK	Success			
remark					
demo					

4.20 MfSdkNfcM1Read

Prototype	LIB_EXPORT s32 MfSdkNfcM1Read(s32 block, u8* buf, s32 *len)		
------------------	---	--	--

Function		
Params	in	block
		len
	out	buf
return		Others Failed, Ref. MfSdkNfcRet_E
		MFSDK_NFC_RET_Success OK
remark		
demo		

4.21 MfSdkNfcM1Restore

Prototype	LIB_EXPORT s32 MfSdkNfcM1Restore(s32 block)	
Function		
Params	in	block
	out	None
return		Others Failed, Ref. MfSdkNfcRet_E
		MFSDK_NFC_RET_Success OK
remark		
demo		

4.22 MfSdkNfcM1SetKey

Prototype	LIB_EXPORT s32 MfSdkNfcM1SetKey(u8 *key)	
Function		
Params	in	key
	out	None
return		Others Failed, Ref. MfSdkNfcRet_E
		MFSDK_NFC_RET_Success OK

remark	
demo	

4.23 MfSdkNfcM1Transfer

Prototype	LIB_EXPORT s32 MfSdkNfcM1Transfer(s32 block)	
Function		
Params	in	block
	out	None
return		Others Failed, Ref. MfSdkNfcRet_E MFSDK_NFC_RET_ Success OK
remark		
demo		

4.24 MfSdkNfcM1Uid

Prototype	LIB_EXPORT s32 MfSdkNfcM1Uid(u8 *uid)	
Function		
Params	in	uid
	out	None
return		Others Failed, Ref. MfSdkNfcRet_E MFSDK_NFC_RET_ Success OK
remark		
demo		

4.25 MfSdkNfcM1Write

Prototype	LIB_EXPORT s32 MfSdkNfcM1Write(s32 block, u8 *buf, s32 len)
------------------	---

Function		
Params	in	block
		buf
		len
	out	None
return		Others Failed, Ref. MfSdkNfcRet_E MFSDK_NFC_RET_Success OK
remark		
demo		

4.26 MfSdkNfcOpen

Prototype	LIB_EXPORT s32 MfSdkNfcOpen(void)	
Function	NFC open	
Params	in	None
	out	None
return	Others	Failed, Ref. MfSdkNfcRet_E
	MFSDK_NFC_RET_Success	
	OK	
	remark	
demo		

4.27 MfSdkNfcReset

Prototype	LIB_EXPORT s32 MfSdkNfcReset(u8* pAtr, s32 iAtrLength)	
Function	NFC Reset	
Params	in	pAtr
		iAtrLength
	out	None
return	Others	Failed, Ref. MfSdkNfcRet_E

	MFSDK_NFC_RET_- Success OK
remark	
demo	

4.28 MfSdkNfcTagEmulateInitSetData

Prototype	s32 MfSdkNfcTagEmulateInitSetData(s8* data, s32 inDataLen, s8* code)	
Function	ntag set data initialization	
Params	in	data data
		inDataLen data len
		code data encoding format(example "utf-8")
	out	None
return	Others	Failed, Ref. MfSdkNfcRet_E
	MFSDK_NFC_RET_- Success OK	
remark		
demo		

4.29 MfSdkNfcTagEmulateInitSetUrl

Prototype	s32 MfSdkNfcTagEmulateInitSetUrl(u8* url)	
Function	ntag set url initialization	
Params	in	url set url
	out	None
return	Others	Failed, Ref. MfSdkNfcRet_E
	MFSDK_NFC_RET_- Success OK	
remark		
demo		

4.30 MfSdkNfcTagEmulateProcess

Prototype		void MfSdkNfcTagEmulateProcess(void)
Function		ntag execution processing
Params	in	None
	out	None
return		None
remark		
demo		

4.31 MfSdkNfcTagEmulateDeinit

Prototype		s32 MfSdkNfcTagEmulateDeinit(void)
Function		ntag deinitialization
Params	in	None
	out	None
return		MFSDK_NFC_RET_Success OK
remark		
demo		

4.32 MfSdkNfcLed

Prototype		LIB_EXPORT void MfSdkNfcLed(MfSdkNfcLed_E num, MfSdkNfcLedSwitch_E type)
Function		led control
Params	in	num led color, Ref. MfSdkNfcLed_E
		type switch type, Ref. MfSdkNfcLedSwitch_E

	out	None
return		None
remark		
demo		

4.33 MfSdkNfcIsAroundFrontLcd

Prototype		LIB_EXPORT MFSDKBOOL MfSdkNfcIsAroundFrontLcd(void)
Function		Check whether the NFC antenna is around the LCD
Params	in	None
	out	None
return		MFSDK_TRUE nfc antenna around lcd
remark		
demo		

5 Magstripe module

5.1 Module description

This module mainly includes Magstripe Card APIs.

5.2 Module structure declaration

None.

5.3 Constant declarations

```
typedef enum
{
    MFSDK_MAG_RET_FAILED = -3, //failed
    MFSDK_MAG_RET_BOUNDS = -2, //Array out-of-bounds
    MFSDK_MAG_RET_PARM_ERROR = -1, //check param
    MFSDK_MAG_RET_OK = 0,
}MfSdkMagRet_E;
```

5.4 MfSdkMagStripeDetect

Prototype		LIB_EXPORT s32 MfSdkMagStripeDetect(MfSdkMagTraceInfo_T *trackinfo)
Function		Magstripe Card Detect
Params	in	trackinfo
	out	None
return	Others	Failed, Ref. MfSdkMagRet_E
	MFSDK_MAG_RET_OK	Success
remark		
demo		

5.5 MfSdkMagtekClose

Prototype		LIB_EXPORT void MfSdkMagtekClose(void)
Function		
Params	in	None
	out	None
return		None
remark		
demo		

5.6 MfSdkMagTekFlush

Prototype		LIB_EXPORT s32 MfSdkMagTekFlush(void)
Function		
Params	in	None
	out	None

return	Others	Failed, Ref. MfSdkMagRet_E
	MFSDK_MAG_RET_OK	Success
remark		
demo		

5.7 MfSdkMagtekOpen

Prototype	LIB_EXPORT void MfSdkMagtekOpen(void)	
Function		
Params	in	None
	out	None
return	None	
remark		
demo		

6 ICC module

6.1 Module description

This module mainly includes ICC APIs.

6.2 Module structure declaration

None.

6.3 Constant declarations

```
typedef enum
{
    MFSDK_ICC_SLOT_MIN = 0,
    MFSDK_ICC_SLOT_NFC = MFSDK_ICC_SLOT_MIN, //rfid
    MFSDK_ICC_SLOT_NFC_EXTERN , //rfid extern
    MFSDK_ICC_SLOT_ICC, //contact ic card slot
    MFSDK_ICC_SLOT_ICC_EXTERN, //contact ic card slot extern
    MFSDK_ICC_SLOT_PSAM1,
```

```

MFSDK_ICC_SLOT_PSAM2,
MFSDK_ICC_SLOT_PSAM3,
MFSDK_ICC_SLOT_PSAM4,
MFSDK_ICC_SLOT_PSAM5,
MFSDK_ICC_SLOT_PSAM6,
MFSDK_ICC_SLOT_MAX
}MfSdkIccSlot_E;

typedef enum
{
    MFSDK_ICC_RET_MUTILCARD = -5, // more than one card
    MFSDK_ICC_RET_NOCARD = -4, // dont find card
    MFSDK_ICC_RET_FAILED = -3, //failed
    MFSDK_ICC_RET_BOUNDS = -2, //Array out-of-bounds
    MFSDK_ICC_RET_PARM_ERROR = -1, //check param
    MFSDK_ICC_RET_OK = 0,
}MfSdkIccRet_E;

typedef enum
{
    MFSDK_ICC_TYPE_CPUCARD = 0,
}

}MfSdkIccType_E;

```

6.4 MfSdkIccClose

Prototype		LIB_EXPORT s32 MfSdkIccClose(MfSdkIccSlot_E iSlotType)	
Function			
Params	in	iSlotType	Ref. MfSdkIccSlot_E
	out	None	
return		MFSDK_ICC_RET_ Success OK Other Fail	
remark			
demo			

6.5 MfSdkIccComm

Prototype	LIB_EXPORT s32 MfSdkIccComm(s32 iCardType,MfSdkIccSlot_E iSlotType, MfSdkIccApdu_T *Apdu)		
Function			
Params	in	iCardType	Ref. MfSdkIccType_E
		iSlotType	Ref. MfSdkIccSlot_E
	out	Apdu	
return	Ref. MfSdkIccRet_E		
remark			
demo			

6.6 MfSdkIccGetCardATR

Prototype	LIB_EXPORT s32 MfSdkIccGetCardATR(s32 iCardType, MfSdkIccSlot_E iSlotType, u8 *psATR, s32*pnATRLen)		
Function			
Params	in	iCardType	Ref. MfSdkIccType_E
		iSlotType	Ref. MfSdkIccSlot_E
		psATR	
		pnATRLen	
	out	None	
return	Ref. MfSdkIccRet_E		
remark			
demo			

6.7 MfSdkIccGetCardStatus

Prototype	LIB_EXPORT s32 MfSdkIccGetCardStatus(MfSdkIccSlot_E iSlotType)
------------------	--

Function		
Params	in	iSlotType Ref. MfSdkIccSlot_E
	out	None
return		Ref. MfSdkIccRet_E
remark		
demo		

6.8 MfSdkIccGetModuleVer

Prototype	LIB_EXPORT s32 MfSdkIccGetModuleVer(u8 *pszVer)	
Function	get module version	
Params	in	None
	out	pszVer Icc Module Version
return		Ref. MfSdkIccRet_E
remark		
demo		

6.9 MfSdkIccInsertDetect

Prototype	LIB_EXPORT s32 MfSdkIccInsertDetect(void)	
Function		
Params	in	None
	out	None
return		Ref. MfSdkIccRet_E
remark		
demo		

6.10 MfSdkIccApdu

Prototype		LIB_EXPORT s32 MfSdkIccApdu(MfSdkIccSlot_E iSlotType, u8* pC_Apdu, s32 cLength,u8* pR_Apdu,s32 rLength)	
Function		apdu bytes stream	
Params	in	iSlotType	Ref. MfSdkIccSlot_E
		pC_Apdu	bytes stream
		cLength	
		rLength	
return	out	pR_Apdu	
	> 0	R_Apdu length	
	MFSDK_ICC_RET_PARM_ERROR	params error	
	MFSDK_ICC_RET_BOUND_S	rLength < card response length	
remark			
demo			

6.11 MfSdkIccOpen

Prototype		LIB_EXPORT s32 MfSdkIccOpen(MfSdkIccSlot_E iSlotType)	
Function			
Params	in	iSlotType	Ref. MfSdkIccSlot_E
	out	None	
return		Ref. MfSdkIccRet_E	
remark			
demo			

6.12 MfSdkIccPowerOff

Prototype	LIB_EXPORT s32 MfSdkIccPowerOff(s32 iCardType, MfSdkIccSlot_E iSlotType)
------------------	--

Function	
Params	in
	iCardType Ref. MfSdkIccType_E
	iSlotType Ref. MfSdkIccSlot_E
out	None
return	Ref. MfSdkIccRet_E
remark	
demo	

6.13 MfSdkIccPowerUp

Prototype	LIB_EXPORT s32 MfSdkIccPowerUp(s32 iCardType, MfSdkIccSlot_E iSlotType ,u8 *atrstr,s32 buflen)
Function	
Params	in
	iCardType Ref. MfSdkIccType_E
	iSlotType Ref. MfSdkIccSlot_E
	buflen
out	atrstr
return	Ref. MfSdkIccRet_E
remark	
demo	

6.14 MfSdkIccPowerOn

Prototype	LIB_EXPORT s32 MfSdkIccPowerOn(s32 iCardType, MfSdkIccSlot_E iSlotType)
Function	
Params	in
	iCardType Ref. MfSdkIccType_E
	iSlotType Ref. MfSdkIccSlot_E
out	None
return	Ref. MfSdkIccRet_E
remark	
demo	

7 GUI module

7.1 Module description

This module mainly includes UI APIs.

7.2 Module structure declaration

```
//MfSdkGuiInputPage Parameters
typedef struct
{
    s8* title; //#[in] Title displayed in the middle of the first line
    s8* msgPrompt; //#[in] Prompt information
    s8* str; //#[out] input data string
    s32 disp_mode; //#[in] 0:digit input, 1:character input, 2:password input
    s32 disp_line; //#[in] the number of rows Prompt displayed
    s32 input_line; //#[in] the number of rows inputs displayed
    s32 disp_pattern; //#[in] Prompt display position, 0 left alignment, 1 center; 2
    right alignment
    s32 input_pattern; //#[in] inputs display position, 0 left alignment, 1 center; 2
    right alignment
    s32 min; //#[in] minimum input length
    s32 max; //#[in] maximum input length
    s32 timeout; //#[in] waiting for input timeout time (seconds)
    void (*extra_paint_func)(void *extra_param); //#[in] extra painting function on
    input page
    void* extra_param; //#[in] parameter of extra_paint_func
}MfSdkGuinputPageParam_T;
```

7.3 Constant declarations

None.

7.4 MfSdkGuiLedAmount

Prototype	LIB_EXPORT void MfSdkGuiLedAmount(char *msg)		
Function	Set Amount display		
Params	in	msg	text amount eg. 0.00/1.00
	out	None	

return	Nothing
remark	
demo	MfSdkGuiLedAmount("0.00"); //show amount on code break screen

7.5 MfSdkGuiLedCounter

Prototype		LIB_EXPORT void MfSdkGuiLedCounter(char *msg)	
Function		Show Counter display	
Params	in	msg	3 bytes ascii digit eg. "0"- "999"
	out	None	
return		Nothing	
remark			
demo		MfSdkGuiLedCounter("0");	

7.6 MfSdkGuiLedTime

Prototype		LIB_EXPORT void MfSdkGuiLedTime(char *msg)	
Function			
Params	in	msg	HHMM eg. "09:00"
	out	None	
return		Nothing	
remark			
demo		MfSdkGuiLedTime("09:00");	

7.7 MfSdkGuiLedDigitShow

Prototype		LIB_EXPORT void MfSdkGuiLedDigitShow(char *digit_str)
Function		Segment code

Params	in	digit_str
	out	None
return	MFSDK_RET_OK Success	
remark		
demo		

7.8 MfSdkGuiBeginBatchPaint

Prototype	LIB_EXPORT void MfSdkGuiBeginBatchPaint()	
Function	Batch refresh starts	
Params	in	None
	out	None
return	Nothing	
remark		
demo	<pre>MfSdkGuiBeginBatchPaint(); MfSdkGuiClearDc(); //painting APIs MfSdkGuiEndBatchPaint();</pre>	

7.9 MfSdkGuiEndBatchPaint

Prototype	LIB_EXPORT void MfSdkGuiEndBatchPaint()	
Function	End of batch refresh	
Params	in	None
	out	None
return	Nothing	
remark		
demo	<pre>MfSdkGuiBeginBatchPaint(); MfSdkGuiClearDc(); //painting APIs MfSdkGuiEndBatchPaint();</pre>	

7.10 MfSdkGuiSetColor

Prototype		LIB_EXPORT void MfSdkGuiSetColor(s32 color)	
Function		Set the foreground color	
Params	in	color	the foreground color
	out	None	
return		Nothing	
remark			
demo			

7.11 MfSdkGuiGetColor

Prototype		LIB_EXPORT s32 MfSdkGuiGetColor()	
Function		Get the foreground color	
Params	in	None	
	out	None	
return		>= 0	success, the foreground color
		Other	failure
remark			
demo		s32 foreground_color = MfSdkGuiGetColor();	

7.12 MfSdkGuiSetBgColor

Prototype		LIB_EXPORT void MfSdkGuiSetBgColor(s32 color)	
Function		Set the background color	
Params	in	color	the background color
	out	None	
return		Nothing	

remark	
demo	

7.13 MfSdkGuiGetBgColor

Prototype	LIB_EXPORT s32 MfSdkGuiGetBgColor()		
Function	Get the background color		
Params	in	None	
	out	None	
return		>= 0	success, the background color
		Other	failure
remark			
demo	s32 background_color = MfSdkGuiGetBgColor();		

7.14 MfSdkGuiSetFullScreen

Prototype	LIB_EXPORT void MfSdkGuiSetFullScreen(s32 full)		
Function	Set to full screen display		
Params	in	full	is full screen display(1 - Yes, 0 - No)
	out	None	
return	Nothing		
remark			
demo	MfSdkGuiSetFullScreen(1); //set full screen		

7.15 MfSdkGuiPixel

Prototype	LIB_EXPORT s32 MfSdkGuiPixel(s32 x, s32 y)		
Function	Draw a point		

Params	in	x	horizontal coordinate
		y	vertical coordinate
	out	None	
return	0 success		
	Other failure		
remark			
demo	s32 ret; MfSdkGuiBeginBatchPaint(); MfSdkGuiClearDc(); ret = MfSdkGuiPixel(5 , 5); //draw a point at (5, 5) MfSdkGuiEndBatchPaint();		

7.16 MfSdkGuiLineTo

Prototype	LIB_EXPORT s32 MfSdkGuiLineTo(s32 x, s32 y)		
Function	Draw a line		
Params	in	x	horizontal coordinate
		y	vertical coordinate
	out	None	
return	0 success		
	Other failure		
remark			
demo			

7.17 MfSdkGuiBarRc

Prototype	LIB_EXPORT void MfSdkGuiBarRc(s32 left, s32 top, s32 right, s32 bottom)		
Function	Gui filled area		
Params	in	left	left border
		top	upper boundary
		right	right border
		bottom	lower boundary

out	None
return	Nothing
remark	
demo	MfSdkGuiBeginBatchPaint(); MfSdkGuiClearDc(); MfSdkGuiBarRc(5, 5, 10, 10); MfSdkGuiEndBatchPaint();

7.18 MfSdkGuiSetBarColor

Prototype		LIB_EXPORT void MfSdkGuiSetBarColor(s32 color)	
Function		Set the fill color	
Params	in	color	fill color(format 0x00RRGGBB)
	out	None	
return		Nothing	
remark			
demo			

7.19 MfSdkGuiGetBarColor

Prototype		LIB_EXPORT s32 MfSdkGuiGetBarColor()	
Function		Get the fill color	
Params	in	None	
	out	None	
return		>=0	success, the fill color
		Other	failure
remark			
demo		s32 barColor = MfSdkGuiGetBarColor();	

7.20 MfSdkGuiSetFont

Prototype		LIB_EXPORT void MfSdkGuiSetFont(s32 font)	
Function		Set display font	
Params	in	font	font(0: 12 lattice, 1: 16 lattice)
	out	None	
return		Nothing	
remark			
demo		MfSdkGuiSetFont(0); //set to 12 lattice font	

7.21 MfSdkGuiGetFont

Prototype		LIB_EXPORT s32 MfSdkGuiGetFont()	
Function		Get display font	
Params	in	None	
	out	None	
return		>=0	success, the display font
		Other	failure
remark			
demo		s32 font = MfSdkGuiGetFont();	

7.22 MfSdkGuiSetTextColor

Prototype		LIB_EXPORT void MfSdkGuiSetTextColor(s32 color)	
Function		Set text color	
Params	in	color	text color
	out	None	
return		Nothing	

remark	
demo	

7.23 MfSdkGuiGetTextColor

Prototype	LIB_EXPORT s32 MfSdkGuiGetTextColor()		
Function	Get text color		
Params	in	None	
	out	None	
return		>=0	success, the text color
		Other	failure
remark			
demo	s32 textColor = MfSdkGuiGetTextColor();		

7.24 MfSdkGuiSetTextBgColor

Prototype	LIB_EXPORT void MfSdkGuiSetTextBgColor(s32 color)		
Function	Set the text background color		
Params	in	color	text background color
	out	None	
return	Nothing		
remark			
demo			

7.25 MfSdkGuiGetTextBgColor

Prototype	LIB_EXPORT s32 MfSdkGuiGetTextBgColor()		
Function	Get the text background color		

Params	in	None
	out	None
return	>=0	success, the text background color
	Other	failure
remark		
demo	s32 textBgColor = MfSdkGuiGetTextBgColor();	

7.26 MfSdkGuiClearDc

Prototype	LIB_EXPORT void MfSdkGuiClearDc()	
Function	Clear screen display	
Params	in	None
	out	None
return	Nothing	
remark		
demo	<pre>MfSdkGuiBeginBatchPaint(); MfSdkGuiClearDc(); //painting APIs MfSdkGuiEndBatchPaint();</pre>	

7.27 MfSdkGuiSetTextZoom

Prototype	LIB_EXPORT void MfSdkGuiSetTextZoom(s32 size)	
Function	Set text magnification	
Params	in	size multiple, the default value is 2
	out	None
return	Nothing	
remark		
demo	MfSdkGuiSetTextZoom(4);	

7.28 MfSdkGuiGetTextZoom

Prototype	LIB_EXPORT s32 MfSdkGuiGetTextZoom()	
Function	Get text magnification	
Params	in	None
	out	None
return	>=0	success, the text magnification
	Other	failure
remark		
demo	s32 textZoom = MfSdkGuiGetTextZoom();	

7.29 MfSdkGuiSetPixel

Prototype	LIB_EXPORT s32 MfSdkGuiSetPixel(s32 x, s32 y, s32 color)	
Function	Draw a point with color	
Params	in	x horizontal coordinate
		y vertical coordinate
	out	color point color
		None
return	0	success
	Other	failure
remark		
demo		

7.30 MfSdkGuiGetPixel

Prototype	LIB_EXPORT s32 MfSdkGuiGetPixel(s32 x, s32 y)	
Function	Get the color of the point on the screen	

Params	in	x	horizontal coordinate
		y	vertical coordinate
	out	None	
return	>=0		success, point color
	Other		failure
remark			
demo	s32 pixelColor = MfSdkGuiGetPixel(5, 5); //get the color of point (5, 5)		

7.31 MfSdkGuiTextOut

Prototype	LIB_EXPORT s32 MfSdkGuiTextOut(s32 x, s32 y, char * text)				
Function	Display text on the screen ,Show only English				
Params	in	x	horizontal coordinate		
		y	vertical coordinate		
	text	text content			
out	None				
	return	0	success		
Other		failure			
remark					
demo	<pre>s32 ret = -1; MfSdkGuiBeginBatchPaint(); MfSdkGuiClearDc(); ret = MfSdkGuiTextOut(5, 5, "morefun"); MfSdkGuiEndBatchPaint();</pre>				

7.32 MfSdkGuiGetTextWidth

Prototype	LIB_EXPORT s32 MfSdkGuiGetTextWidth(char *text)		
Function	Get the display width of the text		
Params	in	text	text content
	out	None	
return	>=0		success, the text width

	Other	failure
remark		
demo	s32 textWidth = MfSdkGuiGetTextWidth("morefun");	

7.33 MfSdkGuiGetTextHeight

Prototype	LIB_EXPORT s32 MfSdkGuiGetTextHeight(char *text)	
Function	Get the display height of the text	
Params	in	text text content
	out	None
return	>=0	success, the text height
	Other	failure
remark		
demo	s32 textHeight = MfSdkGuiGetTextHeight("morefun");	

7.34 MfSdkGuiCline

Prototype	LIB_EXPORT void MfSdkGuiCline(s32 x1, s32 y1, s32 x2, s32 y2, s32 color)	
Function	Draw a line	
Params	in	x1 point1 X coordinate
		x2 point2 X coordinate
		y1 point1 Y coordinate
		y2 point2 Y coordinate
		color color of the line
	out	None
return	Nothing	
remark		
demo		

7.35 MfSdkGuiGetWidth

Prototype		LIB_EXPORT s32 MfSdkGuiGetWidth(void)	
Function		Get screen width	
Params	in	None	
	out	None	
return		>=0	success, the screen width
Other			failure
remark			
demo		s32 width = MfSdkGuiGetWidth();	

7.36 MfSdkGuiGetHeight

Prototype		LIB_EXPORT s32 MfSdkGuiGetHeight(void)	
Function		Get screen height	
Params	in	None	
	out	None	
return		>=0	success, the screen height
Other			failure
remark			
demo		s32 height = MfSdkGuiGetHeight();	

7.37 MfSdkGuiPageOpPaint

Prototype		LIB_EXPORT void MfSdkGuiPageOpPaint(char * left_str, char * right_str)	
Function		Bottom options painting	
Params	in	left_str	The character displayed in the lower left corner
		right_str	The character displayed in the lower right corner

	out	None
	return	Nothing
	remark	
	demo	MfSdkGuiBeginBatchPaint(); MfSdkGuiClearDc(); MfSdkGuiPageOpPaint("Cancel", "OK"); MfSdkGuiEndBatchPaint();

7.38 MfSdkGuilmeSetMode

Prototype		LIB_EXPORT s32 MfSdkGuilmeSetMode(s32 def_mode, s32 allow_mode, s32 password)	
Function		Set input method parameters	
Params	in	def_mode	Default input method
		allow_mode	Support input method
		password	enter password
	out	None	
return		0	success
		Other	failure
remark			
demo			

7.39 MfSdkGuilmeStartInput

Prototype		LIB_EXPORT s32 MfSdkGuilmeStartInput(char * buffer, s32 max, char * help)	
Function		Open the input method page	
Params	in	buffer	Input buffer
		max	Maximum input character
		help	Enter page title
	out	None	
return		0	success, the text length
		Other	failure
remark		ONLY for H9G,H9L	

demo	
------	--

7.40 MfSdkGuiMainMenuFuncAdd

Prototype		LIB_EXPORT s32 MfSdkGuiMainMenuFuncAdd(void * pfunc)	
Function		Add menu handler	
Params	in	pfunc	menu handler
	out	None	
return		0	success
		Other	failure
remark			
demo			

7.41 MfSdkGuiMainMenuFuncDel

Prototype		LIB_EXPORT s32 MfSdkGuiMainMenuFuncDel(void * pfunc)	
Function		Del menu handler	
Params	in	pfunc	menu handler
	out	None	
return		0	success
		Other	failure
remark			
demo			

7.42 MfSdkGuiMainMenuShow

Prototype		LIB_EXPORT void MfSdkGuiMainMenuShow(char *id , s32 timeover)
Function		Display menu

Params	in	id	menu id		
		timeover	overtime time		
	out	None			
return	Nothing				
remark					
demo					

7.43 MfSdkGuiPostMessage

Prototype	LIB_EXPORT u32 MfSdkGuiPostMessage(u32 msg_id, u32 wparam, u32 lparam)		
Function	Send a message		
Params	in	msg_id	message id
		wparam	parameter 1
		lparam	parameter 2
	out	None	
return	0 success		
	Other failure		
remark			
demo	MfSdkGuiPostMessage(MFSDK_GUI_GUIPAINT, 0, 0);		

7.44 MfSdkGuiGetMessage

Prototype	LIB_EXPORT u32 MfSdkGuiGetMessage(MfSdkGuiMsg_T * pmsg , s32 timeover)		
Function	Recv a message		
Params	in	pmsg	message structure
		timeover	overtime time
	out	None	
return	0 success		
	Other failure		
remark			
demo	MfSdkGuiMsg_T pmsg; if(MfSdkGuiGetMessage(&pmsg, 100) == 0)		

	{ //TODO }
--	------------------

7.45 MfSdkGuiProcDefaultMsg

Prototype	LIB_EXPORT s32 MfSdkGuiProcDefaultMsg(MfSdkGuiMsg_T * pmsg)	
Function	Let the system process the default message	
Params	in	pmsg message structure
	out	None
return	0	success
	Other	failure
remark		
demo		

7.46 MfSdkGuiMessageBoxShow

Prototype	LIB_EXPORT s32 MfSdkGuiMessageBoxShow(char *title, char *msg , char* pszLeftOp, char* pszRightOp , s32 timeover)	
Function	Display dialog	
Params	in	title message title
		msg message content
		pszLeftOp bottom left corner
		pszRightOp tip in the lower right corner
		timeover overtime time
	out	None
return	1	Confirm return
	2	Cancel back
	3	Timeout
	Other	failure
remark		
demo	int ret = -1; ret = MfSdkGuiMessageBoxShow("Tips", "Success", "Cancel", "Confirm", "30 * 1000");	

7.47 MfSdkGuiLoadBmpEx

Prototype	LIB_EXPORT char *MfSdkGuiLoadBmpEx(char * filename, int *width, int *height, int * color)		
Function	Load bmp into memory		
Params	in	filename	image name
	out	width	image width
		height	image height
		color	image color
return		!=0	success,Image content array, which needs to be released after use
		0	failure
remark			
demo	<pre>#define LOGOBMP "data\logo.bmp" char *pbmp = NULL; int logowidth = 0; int logoheight = 0; int logocolor = 0; pbmp = MfSdkGuiLoadBmpEx(LOGOBMP, &logowidth, &logoheight, &logocolor);</pre>		

7.48 MfSdkGuiLoadBmp

Prototype	LIB_EXPORT char *MfSdkGuiLoadBmp(char * filename, s32 *width, s32 *height)		
Function	Load bmp into memory		
Params	in	filename	image name
	out	width	image width
		height	image height
		!=0	success,Image content array, which needs to be released after use
return		0	failure
remark			

demo	<pre>#define LOGOBMP "data\\logo.bmp char *pbmp = NULL; int logowidth = 0; int logoheight = 0; pbmp = MfSdkGuiLoadBmp(LOGOBMP, &logowidth, &logoheight); // bmp only black and white</pre>
-------------	--

7.49 MfSdkGuiBmpFree

Prototype		LIB_EXPORT void MfSdkGuiBmpFree(char * pbmp)	
Function		Free memory of bmp	
Params	in	pbmp	image content array
	out	None	
return		Nothing	
remark			
demo		MfSdkGuiBmpFree(pbmp);	

7.50 MfSdkGuiOutBits

Prototype		LIB_EXPORT void MfSdkGuiOutBits(s32 x, s32 y, unsigned char *pbits, s32 width , s32 height, s32 mode)		
Function		Display image		
Params	in	x	horizontal coordinate	
		y	vertical coordinate	
		pbits	image data	
		width	image width	
		height	image height	
		mode	display mode(0 - Positive, 1 - Reverse)	
out		None		
return		Nothing		
remark				
demo		#define LOGOBMP "data\\logo.bmp"		

```

s8 *pbmp = NULL;
s32 logowidth = 0;
s32 logoheight = 0;

pbmp = MfSdkGuiLoadBmp(LOGOBMP, &logowidth, &logoheight);
if(pbmp)
{
    s32 logotop = (MfSdkGuiGetHeight() - logoheight)/2;
    s32 logoleft = (MfSdkGuiGetWidth() - logowidth)/2;
    MfSdkGuiBeginBatchPaint();
    MfSdkGuiClearDc();
    MfSdkGuiOutBits(logoleft, logotop , pbmp, logowidth , logoheight, 0); //show logo
    at the center of the screen
    MfSdkGuiEndBatchPaint();
}

```

7.51 MfSdkGuiOutBitsEx

Prototype		LIB_EXPORT void MfSdkGuiOutBitsEx(s32 x, s32 y, unsigned char *pbits, s32 width , s32 height, s32 mode , s32 color)
Function		Display image
Params	in	x horizontal coordinate
		y vertical coordinate
		pbits image data
		width image width
		height image height
		mode display mode(0 - Positive, 1 - Reverse)
	out	color bit color of the picture(1,4,24)
return		None
remark		
demo		<pre> #define LOGOBMP "data\\logo.bmp" s8 *pbmp = NULL; s32 logowidth = 0; s32 logoheight = 0; s32 logocolor = 0; </pre>

	<pre> pbmp = MfSdkGuiLoadBmpEx(LOGOBMP, &logowidth, &logoheight, &logocolor); if(pbmp) { s32 logotop = (MfSdkGuiGetHeight() - logoheight)/2; s32 logoleft = (MfSdkGuiGetWidth() - logowidth)/2; MfSdkGuiBeginBatchPaint(); MfSdkGuiClearDc(); MfSdkGuiOutBitsEx(logoleft, logotop , pbmp, logowidth , logoheight, 0, logocolor); //show logo at the center of the screen MfSdkGuiEndBatchPaint(); } </pre>
--	--

7.52 MfSdkGuiOutBitsZoom

Prototype	LIB_EXPORT void MfSdkGuiOutBitsZoom(s32 x, s32 y, unsigned char *pbits, s32 width , s32 height, s32 mode , s32 zoom)	
Function	Display image	
Params	in	x horizontal coordinate
		y vertical coordinate
		pbits image data
		width image width
		height image height
		mode display mode(0 - Positive, 1 - Reverse)
		zoom amplification factor
	out	None
return	Nothing	
remark		
demo		

7.53 MfSdkGuiTextWidthEx

Prototype	LIB_EXPORT s32 MfSdkGuiTextWidthEx(char * str)		
Function	get text width		
Params	in	str	text content

out	None	
return	>=0	success, the text width
	Other	failure
remark		
demo		

7.54 MfSdkGuiTextOutEx

Prototype	LIB_EXPORT s32 MfSdkGuiTextOutEx(s32 x, s32 y,char * str)	
Function	Display text on the screen ,Show different languages	
Params	in	x horizontal coordinate
		y vertical coordinate
		str text content
	out	None
return	0	success
	Other	failure
remark		
demo	<pre>s32 ret = -1; MfSdkGuiBeginBatchPaint(); MfSdkGuiClearDc(); ret = MfSdkGuiTextOutEx(5, 5, "morefun"); MfSdkGuiEndBatchPaint();</pre>	

7.55 MfSdkGuiSetTextStyle

Prototype	LIB_EXPORT void MfSdkGuiSetTextStyle(s32 textStyle)	
Function	Setting Text Style	
Params	in	textStyle text style(0 - opaque, 1 - transparent)
	out	None
return	Nothing	
remark		
demo	MfSdkGuiSetTextStyle(0);	

7.56 MfSdkGuiSelectPageEx

Prototype		LIB_EXPORT s32 MfSdkGuiSelectPageEx(char *title , char *items[],s32 itemscount,s32 timeover, s32 select)
Function		select page
Params	in	title the title of the select page
		items menu items
		itemscount number of menu items
		timeover menu timeout
		select default menu item
	out	None
return		>=0 success, index in items of chosen item Other failure
remark		
demo		

7.57 MfSdkGuiSelectPageExT

Prototype		LIB_EXPORT s32 MfSdkGuiSelectPageExT(char *title ,char items[][255],s32 itemscount,s32 timeover, s32 select)
Function		select page
Params	in	title the title of the select page
		items menu items
		itemscount number of menu items
		timeover menu timeout
		select default menu item
	out	None
return		>=0 success, index in items of chosen item Other failure
remark		
demo		

7.58 MfSdkGuiSelectPageCb

Prototype		LIB_EXPORT s32 MfSdkGuiSelectPageCb(char *title , char *items[],int itemscount,int timeover,int select,char callback_key,int (*callbackfunc)(const void *items[],const int itemscount))
Function		select page with key trigger callback function
Params	in	title the title of the select page
		items menu items
		itemscount number of menu items
		timeover menu timeout
		select default menu item
		callback_key the key used to trigger the callback (recommend KEY_0 or KEY_BACKSPACE)
	out	callbackfunc callback function
out		None
return		>=0 success, index in items of chosen item
		Other failure
remark		
demo		

7.59 MfSdkGuiTitleColorBackground

Prototype		LIB_EXPORT void MfSdkGuiTitleColorBackground(s32 color)
Function		set the background color of title
Params	in	color the background color of title
	out	None
return		Nothing
remark		only for H9G, H9L
demo		

7.60 MfSdkGuiTitleColorForeground

Prototype		LIB_EXPORT void MfSdkGuiTitleColorForeground(s32 color)	
Function		set the foreground color of title	
Params	in	color	the foreground color of title
	out	None	
return		Nothing	
remark		only for H9G, H9L	
demo			

7.61 MfSdkGuiTitleFont

Prototype		LIB_EXPORT void MfSdkGuiTitleFont(int font)	
Function		Set title font	
Params	in	font	font(0 - 12 lattice, 1 - 16 lattice)
	out	None	
return		Nothing	
remark		only for H9G, H9L	
demo			

7.62 MfSdkGuiMenuHightlineColor

Prototype		LIB_EXPORT void MfSdkGuiMenuHightlineColor(s32 color)	
Function		set the color of menu hightline	
Params	in	color	the color of menu hightline
	out	None	
return		Nothing	
remark		only for H9G, H9L	

demo	
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7.63 MfSdkGuiTextOutLineCenter

Prototype		LIB_EXPORT void MfSdkGuiTextOutLineCenter(char *pMsg , s32 top)	
Function		Display text in the line center on the screen,Show only English	
Params	in	pMsg	text content
		top	top coordinate
out		None	
return		Nothing	
remark			
demo		<pre>MfSdkGuiBeginBatchPaint(); MfSdkGuiClearDc(); //clean screen //show "Morefun" at the center of line 5 on screen MfSdkGuiTextOutLineCenter("Morefun", MFSDK_GUI_LINE_TOP(5)); MfSdkGuiBeginEndPaint();</pre>	

7.64 MfSdkGuiTextOutLineRight

Prototype		LIB_EXPORT void MfSdkGuiTextOutLineRight(char *pMsg , s32 top)	
Function		Display text in the line right on the screen,Show only English	
Params	in	pMsg	text content
		top	top coordinate
out		None	
return		Nothing	
remark			
demo		<pre>MfSdkGuiBeginBatchPaint(); MfSdkGuiClearDc(); //clean screen //show "Morefun" at the right of line 5 on screen MfSdkGuiTextOutLineRight("Morefun", MFSDK_GUI_LINE_TOP(5)); MfSdkGuiBeginEndPaint();</pre>	

7.65 MfSdkGuiTextOutLineLeft

Prototype	LIB_EXPORT void MfSdkGuiTextOutLineLeft(char *pMsg , s32 top)	
Function	Display text in the line left on the screen,Show only English	
Params	in	pMsg text content
		top top coordinate
	out	None
return	Nothing	
remark		
demo	<pre>MfSdkGuiBeginBatchPaint(); MfSdkGuiClearDc(); //clean screen //show "Morefun" at the left of line 5 on screen MfSdkGuiTextOutLineLeft("Morefun", MFSDK_GUI_LINE_TOP(5)); MfSdkGuiBeginEndPaint();</pre>	

7.66 MfSdkGuiTextOutWinCenter

Prototype	LIB_EXPORT void MfSdkGuiTextOutWinCenter(char *pmsg)	
Function	Display text in the middle of the screen,Show only English	
Params	in	pmsg text content
		None
	out	
return	Nothing	
remark		
demo	<pre>MfSdkGuiBeginBatchPaint(); MfSdkGuiClearDc(); //clean screen MfSdkGuiTextOutWinCenter("Morefun"); //show "Morefun" at the center of the screen MfSdkGuiBeginEndPaint();</pre>	

7.67 MfSdkGuiClearRect

Prototype		LIB_EXPORT void MfSdkGuiClearRect(s32 left, s32 top, s32 right, s32 bottom, s32 color)	
Function		Refresh the specified area	
Params	in	left	left border
		top	upper boundary
		right	right border
		bottom	lower boundary
		color	refresh with specified color
Params	out	None	
	return	Nothing	
remark			
demo			

7.68 MfSdkGuiMessageBoxShowEx

Prototype		LIB_EXPORT s32 MfSdkGuiMessageBoxShowEx(char *title, char *msg , char* pszLeftOp, char* pszRightOp , s32 timeover,s32 flag,unsigned char * keylist, s32 * presskey)	
Function		Display dialog	
Params	in	title	message title
		msg	message content
		pszLeftOp	bottom left corner
		pszRightOp	tip in the lower right corner
		timeover	overtime time
		flag	show timeout on title right side(1 - Yes, 0 - No)
		support	key value eg:{key0,key1,keyok}
	out	presskey	return press key value
return		1	Confirm return
		2	Cancel back
		3	Timeout
		Other	Failure
remark			

demo	
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7.69 MfSdkGuiSetTitle

Prototype		LIB_EXPORT void MfSdkGuiSetTitle(char *title)	
Function		Set title	
Params	in	title	title string
	out	None	
return		Nothing	
remark			
demo			

7.70 MfSdkGuiTextOutHighlight

Prototype		LIB_EXPORT s32 MfSdkGuiTextOutHighlight(s32 x, s32 y, s32 y2,char * text)	
Function		Highlight a line of text	
Params	in	x	the starting x coordinate of the highlight
		y	the starting y coordinate of the highlight
		y2	the ending y coordinate of the highlight
		text	the text want to highlight
	out	None	
return		0	success
		Other	failure
remark			
demo			

7.71 MfSdkGuiRectHighlight

Prototype		LIB_EXPORT s32 MfSdkGuiRectHighlight(int x, int x2, int y, int y2)	
------------------	--	--	--

Function		Highlight an area		
Params	in	x	the starting x coordinate of the highlight	
		x2	the ending x coordinate of the highlight	
		y	the starting y coordinate of the highlight	
		y2	the ending y coordinate of the highlight	
out		None		
		return	0 success Other failure	
remark				
demo				

7.72 MfSdkGuiDefaultMsgFuncAdd

Prototype		LIB_EXPORT s32 MfSdkGuiDefaultMsgFuncAdd(void * pfunc)	
Function		Add default message processing	
Params	in	pfunc	message processing function
	out	None	
return	0 success		
	Other failure		
remark			
demo			

7.73 MfSdkGuiMenuItemAdd

Prototype		LIB_EXPORT s32 MfSdkGuiMenuItemAdd(MfSdkGuiMenuItemDef_T * menu_item)	
Function		Add menu item	
Params	in	menu_item	menu item
	out	None	
return	0 success		
	Other failure		

remark	
demo	

7.74 MfSdkGuiMainMenuItemDel

Prototype		LIB_EXPORT s32 MfSdkGuiMainMenuItemDel(char *name ,char *id)	
Function		Delete menu item	
Params	in	name	the value of st_gui_menu_item_def->name
	out	id	the value of st_gui_menu_item_def->id
return		None	
		0	success
		Other	failure
remark			
demo			

7.75 MfSdkGuiKeyGetEvent

Prototype		LIB_EXPORT s32 MfSdkGuiKeyGetEvent(MfSdkGuiKeyEvent_T *key_event)	
Function		get event	
Params	in	None	
	out	key_event	event structure
return		0	success
		Other	failure
remark			
demo			

7.76 MfSdkGuiWifiSetPage

Prototype	LIB_EXPORT s32 MfSdkGuiWifiSetPage()
------------------	--------------------------------------

Function		
Params	in	None
	out	None
return		0 success
remark		
demo		

7.77 MfSdkGuiSetProcs

Prototype	LIB_EXPORT void MfSdkGuiSetProcs(MfSdkGuiSignProcs_T *procs)	
Function	Set sign processing function	
Params	in	procs the sign processing function
	out	None
return		Nothing
remark		
demo		

7.78 MfSdkGuiSignExist

Prototype	LIB_EXPORT int MfSdkGuiSignExist(const char *index)	
Function	Determine whether it has been signed	
Params	in	index Signature index
	out	None
return	0	success
	other	failure
remark		
demo		

7.79 MfSdkGuiSignProc

Prototype		LIB_EXPORT int MfSdkGuiSignProc(const char *index, const char *date, const char *refno, int timeout)		
Function		Signature processing		
Params	in	index	Signature index	
		date	Device date	
		refno	Reference No	
		timeout	timeout time	
return	out	None		
	return	0	success	
Other		failure		
remark		API: gui_sign_proc and gui_sign_proc2 merge to MfSdkGuiSignProc		
demo				

7.80 MfSdkGuiSignPrint

Prototype		LIB_EXPORT const char *MfSdkGuiSignExist(const char *index)	
Function		Get sign print string	
Params	in	index	Signature index
	out	None	
return		!=0	success, the print string
		0	failure
remark			
demo			

7.81 MfSdkGuiSignEncode

Prototype		LIB_EXPORT int MfSdkGuiSignEncode(const char *index, char **jbigencode)

Function	JBIG encoding interface		
Params	in	index	Signature index
	out	jbigencode	JBIG encoded signature data
return		!=0	success, the print string
		0	failure
remark			
demo			

7.82 MfSdkGuiSignEncodeFree

Prototype	LIB_EXPORT int MfSdkGuiSignEncodeFree(char *jbigencode)		
Function	JBIG results released		
Params	in	jbigencode	the JBIG result
	out	None	
return		0	success
		Other	failure
remark			
demo			

7.83 MfSdkGuiSignClean

Prototype	LIB_EXPORT int MfSdkGuiSignClean()		
Function	Clean up signature data		
Params	in	None	
	out	None	
return		0	success
		Other	failure
remark			
demo			

7.84 MfSdkGuiSignSavetofile

Prototype	LIB_EXPORT int MfSdkGuiSignSavetofile(char *filename, const char *index)		
Function	Save signature to file		
Params	in	filename	the filename of Signature
		index	Signature index
	out	None	
return	0 success		
	Other failure		
remark			
demo			

7.85 MfSdkGuiSetPowerfullColor

Prototype	LIB_EXPORT void MfSdkGuiSetPowerfullColor(unsigned int iColor)				
Function	set powerfull color				
Params	in	iColor	0xFF0000(red)/ 0x00FF00(green) / 0x0000FF(blue)		
		None			
return	Nothing				
remark					
demo					

7.86 MfSdkGuiStateFuncAdd

Prototype	LIB_EXPORT int MfSdkGuiStateFuncAdd(void * pfunc)		
Function			
Params	in	pfunc	

	out	None
return	0	success
remark		
demo		

7.87 MfSdkGuiClearState

Prototype		LIB_EXPORT void MfSdkGuiClearState(int left , int width)
Function		
Params	in	left
		width
	out	None
return	Nothing	
remark		
demo		

7.88 MfSdkGuiOutStateBitsColor

Prototype		LIB_EXPORT void MfSdkGuiOutStateBitsColor(int x, int y, unsigned char *pbits, int width , int height, int mode , int fc ,int bc)
Function		
Params	in	x
		y
		pbits
		width
		height
		mode
		fc
		bc
	out	None
return	Nothing	
remark		

demo	
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7.89 MfSdkGuiGetDefineColor

Prototype		LIB_EXPORT int MfSdkGuiGetDefineColor(int index)
Function		
Params	in	index
	out	None
return		
remark		
demo		

7.90 MfSdkGuiSetCurlSocketIcon

Prototype		LIB_EXPORT void MfSdkGuiSetCurlSocketIcon(char* recv_icon,char* send_icon,int x)	
Function		set curl socket status icon	
Params	in	recv_icon recv icon buf	
		send_icon send icon buf	
		x X-coordinate offset	
out		None	
return		Nothing	
remark		icon buf only 30*30 1-bit bmp	
demo			

7.91 MfSdkGuiRefreshMod

Prototype		LIB_EXPORT void MfSdkGuiRefreshMod(int mod)
Function		Set the screen refresh mode, disable by default

Params	in	mod	0:Open the refresh task(It is recommended to set when the code has a large number of pixels)
	out	None	
return			
remark	Called once after the sys_init		
demo			

8 Printer module

8.1 Module description

This module mainly includes printer APIs.

8.2 Module structure declaration

None

8.3 Constant declarations

```

typedef enum
{
    MFSDK_PRT_SUCCESS = 0, //Success
    MFSDK_PRT_FAIL = -1, //Printer unknown fault
    MFSDK_PRT_DEV_FAIL = -2, //Printer device failure
    MFSDK_PRT_OUTOF_PAPER = -3, //The printer is out of paper
    MFSDK_PRT_LOSE_COMMAND = -4, //Print handle not obtained
    MFSDK_PRT_FILE_FAIL = -5, //Fail to open the file
    MFSDK_PRT_HANDLE_BACK = -6, //Split machine handle is not put
back
    MFSDK_PRT_CACHE_ERR = -7, //Save cache failed
    MFSDK_PRT_PARM_ERROR = -8, //Parameter error
}MfSdkPrtRet_E;

typedef enum
{
    MFSDK_PRT_PATTERN_LEFT = 0, //left
    MFSDK_PRT_PATTERN_CENTER = 1, //center
    MFSDK_PRT_PATTERN_RIGHT = 2, //right
}MfSdkPrtPattern_E;

```

8.4 MfSdkPrtInit

Prototype	LIB_EXPORT s32 MfSdkPrtInit(void)
Function	Printer initialize, check the printer status (if it is out of paper).
Params	in Nothing
	out Nothing
return	For details, see MfSdkPrtRet_E
remark	
demo	<pre>S32 ret = MfSdkPrtInit(); if(ret == MFSDK_PRT_SUCCESS) { //TODO }</pre>

8.5 MfSdkPrtStr

Prototype	LIB_EXPORT s32 MfSdkPrtStr(s8 *str, s32 linegap, MFSDKBOOL newline)	
Function	String printing with automatic line break function, support \r\n newline	
Params	in	s8 *str Need to print string information
		s32 linegap Line spacing: unit pixels, 0 is the default value (for Pin printing use)
		MFSDKBOOL newline 0 Does not support line breaks;1 support \r\n newline
	out	Nothing
return	For details, see MfSdkPrtRet_E	
remark	Save the string to the printer cache and call Print Start (Print_Start) to print	
demo	<pre>S32 ret = UPrint_Str("AMOUNT", 1, 1); if(ret == MFSDK_PRT_SUCCESS) { //TODO }</pre>	

8.6 MfSdkPrtBitMap

Prototype	LIB_EXPORT s32 MfSdkPrtBitMap(s8 *BmpFile, MfSdkPrtPattern_E pattern)	
Function	print image (XXX.bmp)	
Params	in	s8 *BmpFile Image file name (XXX.bmp) MfSdkPrtPattern_E pattern alignment (see 'MfSdkPrtPattern_E' enum) out
		Nothing
return	For details, see MfSdkPrtRet_E	
remark		
demo	<pre>S32 ret =MfSdkPrtBitMap("data//img_mof.bmp", MFSDK_PRT_PATTERN_CENTER); if(ret == MFSDK_PRT_SUCCESS) { //TODO }</pre>	

8.7 MfSdkPrtStart

Prototype	LIB_EXPORT s32 MfSdkPrtStart(void)	
Function	Start printing	
Params	in	Nothing
	out	Nothing
return	For details, see MfSdkPrtRet_E	
remark	Thermal printing: no more blank lines (processed by the application layer) are required after printing is completed;	
demo	<pre>S32 ret = MfSdkPrtStart(); if(ret == MFSDK_PRT_SUCCESS) { //TODO }</pre>	

8.8 MfSdkPrtStrBold

Prototype		LIB_EXPORT s32 MfSdkPrtStrBold(s8 *pszStr, MfSdkPrtPattern_E pattern, s32 linegap, MFSDKBOOL newline)	
Function		String printing with automatic line break function, support \r\n newline	
Params	in	s8 *pszStr	Need to print string information
		MfSdkPrtPattern_E	alignment (see 'MfSdkPrtPattern_E' enum) pattern
		s32 linegap	Line spacing, unit pixels, 0 is the default value (for Pin printing use)
		MFSDKBOOL	0 Does not support line breaks;1 support \r\n newline newline
	out	Nothing	
return		For details, see MfSdkPrtRet_E	
remark			
demo		<pre>S32 ret = MfSdkPrtStrBold("MFSDK" ,MFSDK_PRT_PATTERN_LEFT,10,1); if(ret == MFSDK_PRT_SUCCESS) { //TODO }</pre>	

8.9 MfSdkPrtFeed

Prototype		LIB_EXPORT s32 MfSdkPrtFeed(s32 linegap)	
Function		Printer paper	
Params	in	s32 linegap	Paper length (pixels)
	out	Nothing	
return		For details, see MfSdkPrtRet_E	
remark			
demo		<pre>S32 ret = MfSdkPrtFeed(36); if(ret == MFSDK_PRT_SUCCESS) { //TODO }</pre>	

8.10 MfSdkPrtMatrixCode

Prototype	LIB_EXPORT s32 MfSdkPrtMatrixCode(const s8 *psMatrixCode, s32 nLen, s8 cSize, MfSdkPrtPattern_E pattern)
Function	Print QR code, Convert incoming data to QR code and print
Params	in const s8 QR code data *psMatrixCode
	s32 nLen QR code data length
	s8 cSize QR code size, 0-small, 1-medium, 2-large
	MfSdkPrtPattern_E alignment (see 'MfSdkPrtPattern_E' enum) pattern
	out Nothing
return	For details, see MfSdkPrtRet_E
remark	
demo	S32 ret = MfSdkPrtMatrixCode("MFSDK" ,6,1,MFSDK_PRT_PATTERN_CENTER); if(ret == MFSDK_PRT_SUCCESS) { //TODO }

8.11 MfSdkPrtSetFontEN

Prototype	LIB_EXPORT s32 MfSdkPrtSetFontEN(s32 size, s32 zoomW, s32 zoomH)
Function	Set print font(English)
Params	in s32 size Set print English font size(0--8)
	s32 zoomW Set the horizontal magnification of English(1--5)
	s32 zoomH Set the vertical magnification of English(1--5)
	out Nothing
return	For details, see MfSdkPrtRet_E
remark	
demo	S32 ret = MfSdkPrtSetFontEN(5,4,4); if(ret == MFSDK_PRT_SUCCESS)

	{ //TODO }
--	------------------

8.12 MfSdkPrtSetFontCN

Prototype	LIB_EXPORT s32 MfSdkPrtSetFontCN(s32 size, s32 zoomW, s32 zoomH)		
Function	Set print font(Chinese)		
Params	in	s32 size	Set print other font size(0--1)
		s32 zoomW	Set the horizontal magnification of English(1--5)
	out	s32 zoomH	Set the vertical magnification of English(1--5)
return	For details, see MfSdkPrtRet_E		
remark			
demo	S32 ret = MfSdkPrtSetFontCN(1,4,4); if(ret == MFSDK_PRT_SUCCESS) { //TODO }		

8.13 MfSdkPrtSetDensity

Prototype	LIB_EXPORT s32 MfSdkPrtSetDensity(s32 val)		
Function	Set print density		
Params	in	s32 val	Set print density (1--5, 3 is normal)
	out	Nothing	
return	For details, see MfSdkPrtRet_E		
remark			
demo	S32 ret = MfSdkPrtSetDensity(3); if(ret == MFSDK_PRT_SUCCESS) { //TODO }		

8.14 MfSdkPrtSetAlign

Prototype		LIB_EXPORT void MfSdkPrtSetAlign(MfSdkPrtPattern_E pattern)
Function		String printing with automatic line break function, support \r\n newline
Params	in	pattern alignment (see 'MfSdkPrtPattern_E' enum)
	out	Nothing
return		Nothing
remark		
demo		MfSdkPrtInit(MFSDK_PRT_PATTERN_CENTER);

8.15 MfSdkPrtSetLineAlign

Prototype		LIB_EXPORT void MfSdkPrtSetLineAlign(MfSdkPrtPattern_E pattern)
Function		Set the line print buffer align format, will not affect next line
Params	in	MfSdkPrtPattern_E alignment (see 'MfSdkPrtPattern_E' enum) pattern
	out	Nothing
return		Nothing
remark		
demo		MfSdkPrtSetLineAlign(MFSDK_PRT_PATTERN_CENTER);

8.16 MfSdkPrtStrLine

Prototype		LIB_EXPORT void MfSdkPrtStrLine(s8 *sLeft, s8 *sRight, s32 nLinegap)
Function		String printing with automatic line feed function, support \r\n newline
Params	in	Nothing
	out	Nothing
return		Nothing

remark	
demo	MfSdkPrtStrLine("amt" , " 123" ,5);

8.17 MfSdkPrtSetLineSpace

Prototype	LIB_EXPORT void MfSdkPrtSetLineSpace(s32 nLinegap)	
Function	set the line space of follow print buffer	
Params	in	nLinegap line space value
	out	Nothing
return	Nothing	
remark		
demo		

8.18 MfSdkPrtSetFontMode

Prototype	LIB_EXPORT void MfSdkPrtSetFontMode(s32 mod)	
Function	Set the printing mode for English letters and numbers	
Params	in	mod 1 Print English letters and numbers characters using font files; 0 or no setting, the default print uses the code font
	out	Nothing
return	Nothing	
remark		
demo		

8.19 MfSdkPrtCheckNopaper

Prototype	LIB_EXPORT s32 MfSdkPrtCheckNopaper()
Function	Check if the device is out of paper

Params	in	Nothing
	out	Nothing
return	Ref. MfSdkPrtRet_E	
remark		
demo		

8.20 MfSdkPrtSetArabicNumOrder

Prototype	LIB_EXPORT s32 MfSdkPrtSetArabicNumOrder(s32 order)	
Function	Set the printing mode for English letters and numbers	
Params	in	order 1:Set up Arabic digital reverse printing
	out	Nothing
return	Ref. MfSdkPrtRet_E	
remark		
demo		

9 Pinpad module

9.1 Module description

This module mainly includes pin entry device.

9.2 Module structure declaration

```

typedef struct
{
    u8 mode; // mode 2,open encrypted pin(The backbutton deletes a pin);
3,open encrypted pin(The backbutton deletes all pin);
    u8 min;//Minimum pin length
    u8 max;//Maximum pin length
    u32 timeoverMs;//timeover(ms)
    u8 isBypass;//Whether to support bypass
} MfSdkPedPinModCfg_T;

typedef struct
{

```

```
s8 appVer[10];
s8 pinpadSn[32];
s8 model[10];
}MfSdkPedPinpadInfo_T;
```

9.3 Constant declarations

```
typedef enum
{
    MFSDK_PED_NOT_KEY = -22,      // No injection key
    MFSDK_PED_PARM_ERROR = -21, // Parameter error
    MFSDK_PED_PINPAD_INSUFFICIENT_SPACE = -16,//The pinpad
space is insufficient
    MFSDK_PED_PINPAD_NO_PUBLIC_KEY_SIGN = -15,/The pinpad
upgrade lacks the public key signature
    MFSDK_PED_PINPAD_REPEAT_SET_MODE = -12, //Repeated
setting mode
    MFSDK_PED_PINPAD_UPDATEFILE_TOO_BIG = -11, // update file
too big
    MFSDK_PED_UPDATEFILE_FORMAT_ERR = -10, // update file
format error
    MFSDK_PED_UPDATE_COMPLETE_RECONNECT_FAILED = -9, //
failed to reconnect to the pinpad after the update is complete
    MFSDK_PED_MD5_FAILED = -8, // pinpad app md5 authentication
failed
    MFSDK_PED_WRITE_FAILED = -7, // pinpad failed to write files
    MFSDK_PED_OPEN_FAILED = -6, // app to be updated failed to open
    MFSDK_PED_NO_APP_UPDATE = -5, // no apps to update(mo
data/pinpad.bin)
    MFSDK_PED_PINPAD_TIMEOUT = -2, // External Pinpad
communication timed out
    MFSDK_PED_OTHER = -1,
    MFSDK_PED_SUCCESS = 0,           // Success
}MfSdkPedRet_E;
typedef enum
{
    MFSDK_PED_ENCRYPT = 0, // Encryption mode
    MFSDK_PED_DECRYPT = 1, // Decryption mode
} MfSdkPedMod_E;

typedef enum
{
    MFSDK_PED_DES_ECB = 0, // des mode ECB
    MFSDK_PED_DES_CBC = 1, // des mode CBC
```

```
 } MfSdkPedDesMod_E;

typedef enum
{
    MFSDK_PED_PINPAD_INPUT_PIN = 0,
    MFSDK_PED_PINPAD_PRESS_OK,
    MFSDK_PED_PINPAD_PRESS_ESC,
}MfSdkPedPinpadStatus_E;

#define MFSDK_MKSK_MAINKEY_TYPE 0x00
#define MFSDK_MKSK_PINENC_TYPE 0x01
#define MFSDK_MKSK_MACENC_TYPE 0x02
#define MFSDK_MKSK_MAGDEC_TYPE 0x03
#define MFSDK_MKSK_TRANSKEY_TYPE 0x04

#define MFSDK_SEC_FIXED_FIELD 0x00
#define MFSDK_SEC_MKSK_FIELD 0x01
#define MFSDK_SEC_DUKPT_FIELD 0x02

#define MFSDK_SEC_MAC_UPAY_FORMAT 0x01
#define MFSDK_SEC_MAC_X99_FORMAT 0x02
#define MFSDK_SEC_MAC_X919_FORMAT 0x03
#define MFSDK_SEC_MAC_XOR_FORMAT 0x04

#define MFSDK_SEC_PIN_FORMAT0 0x00
#define MFSDK_SEC_PIN_FORMAT1 0x01
#define MFSDK_SEC_PIN_FORMAT2 0x02
#define MFSDK_SEC_PIN_FORMAT3 0x03
#define MFSDK_SEC_PIN_FORMAT4 0x04

#define MFSDK_DUKPT_DES_KEY_PIN 0x00
#define MFSDK_DUKPT_DES_KEY_MAC1 0x01
#define MFSDK_DUKPT_DES_KEY_MAC2 0x02
#define MFSDK_DUKPT_DES_KEY_DATA1 0x03
#define MFSDK_DUKPT_DES_KEY_DATA2 0x04
#define MFSDK_DUKPT_DES_KEY_PEK 0x05

typedef enum
{
    MFSDK_PED_TR31_TYPE_IPEK = 0,
    MFSDK_PED_TR31_TYPE_BDK,
}MfSdkPedTr31KeyType_E;
```

```

typedef enum
{
    MFSDK_PED_PINPAD_UPDATE_START = 0x01,
    MFSDK_PED_PINPAD_UPDATEING,
    MFSDK_PED_PINPAD_UPDATE_END,
    MFSDK_PED_PINPAD_RESTORE_CONNECTION,
}MfSdkPedPinpadUpdateStatus_E;

```

9.4 MfSdkPedSetKeySize

Prototype	LIB_EXPORT s32 MfSdkPedSetKeySize(s32 size)				
Function	Set the key length				
Params	in	size	16 or 24		
	out	nothing			
return	For details, see MfSdkPedRet_E .				
remark					
demo	<pre> S32 ret = MfSdkPedSetKeySize(16); if(ret == MFSDK_PED_SUCCESS) { //TODO } </pre>				

9.5 MfSdkPedGetKeySize

Prototype	LIB_EXPORT s32 MfSdkPedGetKeySize(void)				
Function	Get the key length				
Params	in	nothing			
	out	nothing			
return	key length				
remark					
demo	S32 keyLength = MfSdkPedGetKeySize();				

9.6 MfSdkPedDukptLoadKey

Prototype		LIB_EXPORT s32 MfSdkPedDukptLoadKey(s32 mode, s32 type, s32 gid, u8 *init_ksn, u8 *init_key, u8 *kvc)
Function		initialize the dukpt key use IPEK ciphertext
Params	in	s32 mode encryption method of initial key(0 - plaintext, 1 - tmk encryption, 2 - kek encryption)
		s32 type initial key type(0 - ipek, 1 - bdk)
		s32 gid key grouping,,max 100 group (0 - 99)
		u8 *init_ksn initial ksn
		u8 *init_key Initial key
	out	u8 *kvc key kvc(Key plaintext encryption 8 0x00)
return		For details, see MfSdkPedRet_E .
remark		
demo		<pre>u8 kvc[8] = { 0 }; u8 ksn[10] = "\xFF\xFF\x01\x11\x7C\x70\xCA\x00\x00\x00"; u8 ipek[16] = "\xC1\xD0\xF8\xFB\x49\x58\x67\x0D\xBA\x40\xAB\x1F\x37\x52\xEF\x0D"; S32 ret = MfSdkPedDukptLoadKey(0,0,0, ksn, ipek, kvc); if(ret == MFSDK_PED_SUCCESS) { //TODO }</pre>

9.7 MfSdkPedDukpt3desRun

Prototype		LIB_EXPORT s32 MfSdkPedDukpt3desRun(MfSdkPedMod_E mode, s8 *inData, s32 size, s8 *outData, MfSdkPedDesMod_E desMode, s32 keyTpye)
Function		use the previously obtained key 3des operation
Params	in	MfSdkPedMod_E mode (Ref. enum'MfSdkPedMod_E')
		s8 *inData raw data
		s32 size data length (8-byte multiple)
		MfSdkPedDesMod_ desMode (see 'MfSdkPedDesMod_E' enum)

		key type(0 - MFSDK_DUKPT_DES_KEY_PIN, 1 - MFSDK_DUKPT_DES_KEY_MAC1, 2 - MFSDK_DUKPT_DES_KEY_MAC2, 3 - MFSDK_DUKPT_DES_KEY_DATA1, 4 - MFSDK_DUKPT_DES_KEY_DATA2)
	out	s8 *outData out data
return	For details, see MfSdkPedRet_E.	
remark		
demo	<pre>u8 ksn[20] = { 0 }; u8 inData[] = "morefun"; u8 ounData[20] = { 0 }; S32 ret = MfSdkPedDukptGetKsn(0, ksn); if(ret == MFSDK_PED_SUCCESS) { ret = MfSdkPedDukpt3desRun(MFSDK_PED_ENCRYPT, inData, 8, ounData, MFSDK_PED_DES_ECB, MFSDK_DUKPT_DES_KEY_DATA1); if(ret == MFSDK_PED_SUCCESS) { //TODO } }</pre>	

9.8 MfSdkPedDukptGetKsn

Prototype	LIB_EXPORT s32 MfSdkPedDukptGetKsn(u32 gid, u8 *ksn)	
Function	get key corresponds to ksn	
Params	in	u32 gid gid key grouping ,max 100 group (0 - 99)
	out	u8 *ksn key corresponds to ksn
return	For details, see MfSdkPedRet_E.	
remark		
demo	<pre>u8 ksn[20] = { 0 }; S32 ret = MfSdkPedDukptGetKsn(0, ksn); if(ret == MFSDK_PED_SUCCESS) { //TODO }</pre>	

9.9 MfSdkPedMkSkSavePlaintextKey

Prototype		LIB_EXPORT s32 MfSdkPedMkSkSavePlaintextKey(s32 type, u32 gid, u8 *key, u8 *kvc)	
Function		get key corresponds to ksn	
Params	in	type key type(0 - MFSDK_MKSK_MAINKEY_TYPE, 1 - MFSDK_MKSK_PINENC_TYPE, 2 - MFSDK_MKSK_MACENC_TYPE, 3 - MFSDK_MKSK_MAGDEC_TYPE, 4 - MFSDK_MKSK_TRANSKEY_TYPE)	
		u32 gid key grouping ,max 100 group (0 - 99)	
		u8 *key key key plaintext	
		u8 *kvc key kvc(key plaintext encryption 8 0x00)	
return		For details, see MfSdkPedRet_E .	
remark			
demo		u8 kvc[8] = { 0 }; u8 key[16] = "\xC1\xD0\xF8\xFB\x49\x58\x67\x0D\xBA\x40\xAB\x1F\x37\x52\xEF\x0D"; S32 ret = MfSdkPedMkSkSavePlaintextKey(MFSDK_MKSK_MAINKEY_TYPE,0,key, kvc); if(ret == MFSDK_PED_SUCCESS) { //TODO }	

9.10 MfSdkPedMkSkSaveEncryptedKey

Prototype		LIB_EXPORT s32 MfSdkPedMkSkSaveEncryptedKey(s32 type, u32 gid, u8 *key, MfSdkPedDesMod_E desMode, u8 *kvc)
Function		save key ciphertext
Params	in	type key type(0 - MFSDK_MKSK_MAINKEY_TYPE, 1 - MFSDK_MKSK_PINENC_TYPE, 2 - MFSDK_MKSK_MACENC_TYPE,

		3 - MFSDK_MKSK_MAGDEC_TYPE, 4 - MFSDK_MKSK_TRANSKEY_TYPE)
	u32 gid	key grouping ,max 100 group (0 - 99)
	MfSdkPedDesMod_ des mode (see 'MfSdkPedDesMod_E' enum) E desMode	
	u8 *key	key ciphertext
	out	u8 *kvc key kvc(key plaintext encryption 8 0x00)
return	For details, see MfSdkPedRet_E.	
remark		
demo	<pre>u8 kvc[8] = { 0 }; u8 key[16] = "\xC1\xD0\xF8\xFB\x49\x58\x67\x0D\xBA\x40\xAB\x1F\x37\x52\xEF\x0D"; S32 ret = MfSdkPedMkSkSavePlaintextKey(MFSDK_MKSK_MAINKEY_TYPE,0,key, kvc); if(ret == MFSDK_PED_SUCCESS) { //TODO }</pre>	

9.11 MfSdkPedMkSkGetKcv

Prototype	LIB_EXPORT s32 MfSdkPedMkSkGetKcv(s32 keyIndex, s32 keyType, u8 *OutKcv)	
Function	get mksk kcv	
Params	in	s32 keyIndex keyIndex key index(0-99) (0 - MFSDK_MKSK_MAINKEY_TYPE, 1 - MFSDK_MKSK_PINENC_TYPE, 2 - MFSDK_MKSK_MACENC_TYPE, 3 - MFSDK_MKSK_MAGDEC_TYPE, 4 - MFSDK_MKSK_TRANSKEY_TYPE)
		out u8 *OutKcv key kvc(key plaintext encryption 8 0x00)
return	For details, see MfSdkPedRet_E.	
remark		
demo	<pre>u8 kcv[10] = { 0 }; s32 ret = MfSdkPedMkSkGetKcv(0,MFSDK_MKSK_MAINKEY_TYPE,kcv);</pre>	

9.12 MfSdkPedMkSk3desRun

Prototype		LIB_EXPORT s32 MfSdkPedMkSk3desRun(s32 type, s32 gid, MfSdkPedMod_E mode, u8 *ind, s32 size, u8 iv[8], u8 *outd, MfSdkPedDesMod_E desMode)
Function		use key 3des operation
Params	in	(0 - MFSDK_MKSK_MAINKEY_TYPE, 1 - MFSDK_MKSK_PINENC_TYPE, 2 - MFSDK_MKSK_MACENC_TYPE, 3 - MFSDK_MKSK_MAGDEC_TYPE, 4 - MFSDK_MKSK_TRANSKEY_TYPE)
		s32 type key grouping,max 100 group (0 - 99)
		MfSdkPedMod_E mode (see 'MfSdkPedMod_E' enum)
		u8 *ind raw data
		s32 size data length (8-byte multiple)
		u8 iv[8] initialization vector
		MfSdkPedDesMod_E desMode (see 'MfSdkPedDesMod_E' enum)
		desMode
	out	u8 *outd calculation results
return		For details, see MfSdkPedRet_E .
remark		
demo	<pre>u8 ksn[20] = { 0 }; u8 inData[] = "morefun"; u8 ounData[20] = { 0 }; u8 iv[8] = { 0 }; S32 ret = 0; ret = MfSdkPedMkSk3desRun(MFSDK_MKSK_MAINKEY_TYPE, 0,MFSDK_PED_ENCRYPT,inData,8,iv,ounData,MFSDK_PED_DES_ECB); if(ret == MFSDK_PED_SUCCESS) { //TODO} }</pre>	

9.13 MfSdkPedMacProc

Prototype	LIB_EXPORT s32 MfSdkPedMacProc(s32 fid, s32 gid, s32 format, u8 *data, s32 len, u8 *mac, s32 keyTpye, s32 keySize)
------------------	---

Function		computing mac	
Params	in	s32 fid field id (1 - MFSDK_SEC_MKSK_FIELD, 2 - MFSDK_SEC_DUKPT_FIELD) s32 gid key grouping ,max 100 group (0 - 99) s32 format mac format (1 - MFSDK_SEC_MAC_UPAY_FORMAT, 2 - MFSDK_SEC_MAC_X99_FORMAT, 3 - MFSDK_SEC_MAC_X919_FORMAT, 4 - MFSDK_SEC_MAC_XOR_FORMAT) u8 *data mac source data s32 len data length s32 keyTpye key type(1 - MFSDK_DUKPT_DES_KEY_MAC1, 2 - MFSDK_DUKPT_DES_KEY_MAC2) s32 keySize key size	
		out u8 *mac mac	
return		For details, see MfSdkPedRet_E .	
remark			
demo		<pre> U8 data[10] = "x12\x34\x56"; U8 mac[30]={0}; S32 ret = MfSdkPedMacProc(MFSDK_SEC_DUKPT_FIELD,0,MFSDK_SEC_MAC_X919_FORMAT,data,8, mac,MFSDK_DUKPT_DES_KEY_MAC1,16); if(ret == MFSDK_PED_SUCCESS) { //TODO} } </pre>	

9.14 MfSdkPedEncryptPinProc

Prototype		LIB_EXPORT s32 MfSdkPedEncryptPinProc(s32 fid, s32 format, s32 gid, u8 *pan, u8 *pinBlock, u8 *pin)
Function		read pin ciphertext from the security keyboard
Params	in	s32 fid field id (1 - MFSDK_SEC_MKSK_FIELD, 2 - MFSDK_SEC_DUKPT_FIELD) s32 format pin format (0 - MFSDK_SEC_PIN_FORMAT0,

		1 - MFSDK_SEC_PIN_FORMAT1, 2 - MFSDK_SEC_PIN_FORMAT2, 3 - MFSDK_SEC_PIN_FORMAT3, 4 - MFSDK_SEC_PIN_FORMAT4)
	s32 gid	key grouping ,max 100 group (0 - 99)
	u8 *pan	card number
	u8 *pin	pin plaintext
out	u8 *pinBlock	pin Block
return	For details, see MfSdkPedRet_E.	
remark		
demo	<pre>U8 pan[10] = "1234123488888888"; U8 pinblock[30]={0}; S32 ret = MfSdkPedEncryptPinProc(MFSDK_SEC_DUKPT_FIELD,MFSDK_SEC_PIN_FORMAT0,0,pan,pin block,"1234"); if(ret == MFSDK_PED_SUCCESS) { //TODO} }</pre>	

9.15 MfSdkPedSetPinModeCfgInit

Prototype	LIB_EXPORT void MfSdkPedSetPinModeCfgInit(void)	
Function	Pin mode config init pin is plaintext and 4-6 , it does not support bypass MfSdkPedPinModCfg_T flag is 0	
Params	in	Nothing
	out	Nothing
return	Nothing	
remark		
demo		

9.16 MfSdkPedSetPinModeCfg

Prototype	LIB_EXPORT void MfSdkPedSetPinModeCfg(MfSdkPedPinModCfg_T cfg)
------------------	---

Function	Set enable pin input mode config	
Params	in	MfSdkPedPinModC For details, see MfSdkPedPinModCfg_T fg_T cfg
	out	Nothing
return	Nothing	
remark		
demo	<pre>MfSdkPedPinModCfg_T pinCfg = { 0 }; pinCfg.mode = 2; pinCfg.min = 4; pinCfg.max = 6; pinCfg.timeoverMs = 45000; pinCfg.isBypass = 1; MfSdkPedSetPinModeCfg(pinCfg);</pre>	

9.17 MfSdkPedEncryptPinProcEx

Prototype	LIB_EXPORT s32 MfSdkPedEncryptPinProcEx(u8* pan, u8* pinBlock)	
Function	Calculated pinblock value, MfSdkPedSetPinModeCfg needs to be called first.	
Params	in	pan Card PAN
	out	pinBlock
return	For details, see MfSdkPedRet_E .	
remark		
demo	<pre>MfSdkPedPinModCfg_T pinCfg = { 0 }; pinCfg.mode = 2; pinCfg.min = 4; pinCfg.max = 6; pinCfg.timeoverMs = 45000; pinCfg.isBypass = 1; MfSdkPedSetPinModeCfg(pinCfg); u8* pan = "1234567890123456"; u8 pinBlock[8] = {0}; s32 nRet = MfSdkPedEncryptPinProcEx(pan, pinBlock);</pre>	

9.18 MfSdkPedGetPinModeCfg

Prototype	LIB_EXPORT MfSdkPedPinModCfg_T *MfSdkPedGetPinModeCfg(void)	
Function	Get pin input mode config	
Params	in	nothing
	out	nothing
return	MfSdkPedPinModCfg_T point, pin input mode config	
remark		
demo	MfSdkPedPinModCfg_T pinCfg = { 0 }; &pinCfg = MfSdkPedGetPinModeCfg();	

9.19 MfSdkPedGetPinModeStatus

Prototype	LIB_EXPORT s32 MfSdkPedGetPinModeStatus(s32 *length)	
Function	Get pin mode status	
Params	in	Nothing
	out	s32 *length pin length
return	0	Still input
	1	Press the enter(OK) button
	2	Press the exit button
	3	timeover
remark		
demo	S32 len=0; S32 ret = MfSdkPedGetPinModeStatus(&len); If(ret == 1) { //user press the enter(OK) button }	

9.20 MfSdkPedSaveRsaPriKey

Prototype	LIB_EXPORT s32 MfSdkPedSaveRsaPriKey(s32 index, s32 length, u8 *p, u8 *q)	
Function	save the private key to the security module	
Params	in	s32 index index key index (0 - 9)
		s32 length rsa byte size(128/256)
		u8 *p private key P component
		u8 *q private key Q component
	out	Nothing
return	For details, see MfSdkPedRet_E.	
remark		
demo	<pre>s32 ret = MfSdkPedSaveRsaPriKey(0,128," 10" , " 20"); if(ret == MFSDK_PED_SUCCESS) { //TODO} }</pre>	

9.21 MfSdkPedSaveRsaPukKey

Prototype	LIB_EXPORT s32 MfSdkPedSaveRsaPukKey(s32 index, s32 length, u8 *n)	
Function	save the public key to the security module	
Params	in	s32 index index key index (0 - 9)
		s32 length length rsa byte size(128/256)
		u8 *n public key N component
		Nothing
return	For details, see MfSdkPedRet_E.	
remark		
demo	<pre>s32 ret = MfSdkPedSaveRsaPukKey(0,128," 10"); if(ret == MFSDK_PED_SUCCESS) { //TODO} }</pre>	

9.22 MfSdkPedRsaBlock

Prototype		LIB_EXPORT s32 MfSdkPedRsaBlock(s32 index, s8 *inD, s8 *outD, s32 length)	
Function		RSA block calculation	
Params	in	s32 index	index key index (0 - 9)
		s8 *inD	in data
	out	s32 length	rsa key byte size(128/256)
return		For details, see MfSdkPedRet_E .	
remark			
demo		<pre>s8 out[20]={0}; s32 ret = MfSdkPedRsaBlock(0," 1234" ,out,128); if(ret == MFSDK_PED_SUCCESS) { //TODO} }</pre>	

9.23 MfSdkPedDeleteKey

Prototype		LIB_EXPORT s32 MfSdkPedDeleteKey(s32 keyType, s32 keyIndex)	
Function		elete index key	
Params	in	s32 keyType	0:MKSK,1:DUKPT
		s32 keyType	key index(0-99)
	out	Nothing	
return		For details, see MfSdkPedRet_E .	
remark			
demo		<pre>s8 out[20]={0}; s32 ret = MfSdkPedDeleteKey(0,0); if(ret == MFSDK_PED_SUCCESS) { //TODO} }</pre>	

9.24 MfSdkPedTr31GetData

Prototype		LIB_EXPORT s32 MfSdkPedTr31GetData(u32 type, u8 *mk, s32 nKeySize, u8 *data, s32 size, s8 *wk)	
Function		save key plaintext	
Params	in	u32 type	default 0
		u8 *mk	key for decrypt the TR31 string
		s32 nKeySize	mk size
		u8 *data	TR31 string
		s32 size	TR31 data size
	out	s8 *wk	Decrypted key
return		For details, see MfSdkPedRet_E .	
remark			
demo			

9.25 MfSdkPedRkiDukptLoad

Prototype		LIB_EXPORT s32 MfSdkPedRkiDukptLoad(const s8 *keyData, s32 len)		
Function		load the rki key use dukpt		
Params	in	const s8 *keyData	key data	
		s32 len	key length	
		s8 *wk	Decrypted key	
	return	otherr	Failed	
		0	Success	
remark				
demo				

9.26 MfSdkPedRkiCheckAppKey

Prototype	LIB_EXPORT s32 MfSdkPedRkiCheckAppKey(u8 *sHashValue)
------------------	--

Function		verify the app hash	
Params	in	sHashValue	sha256 value of app KEY
	out	Nothing	
return		1, Yes; 0, No	
remark			
demo			

9.27 MfSdkPedSetPinpad

Prototype		LIB_EXPORT s32 MfSdkPedSetPinpad(s32 mod)	
Function		set input pinpad	
Params	in	s32 mod	1:external Pinpad, 0:device's Pinpad
	out	Nothing	
return		For details, see MfSdkPedRet_E.	
remark			
demo		MfSdkPedSetPinpad(1);	

9.28 MfSdkPedGetPinpad

Prototype		LIB_EXPORT s32 MfSdkPedGetPinpad(void)	
Function		get input pinpad	
Params	in	Nothing	
	out	Nothing	
return	1	external Pinpad	
	0	device's Pinpad	
remark			
demo		<pre>s32 ret = MfSdkPedGetPinpad(); If(ret == 1) { //external pinpad }</pre>	

	}
--	---

9.29 MfSdkPedSetPedUi

Prototype	LIB_EXPORT s32 MfSdkPedSetPedUi(u8 *buff, u32 len)				
Function	Send page buf to external pinpad				
Params	in	u8 *buff	page buff		
		u32 len	buff len		
	out	Nothing			
return	For details, see MfSdkPedRet_E				
remark					
demo	<pre>u8 buf[153600]={0}; s32 ret = MfSdkPedSetPedUi(buf,153600); if(ret == MFSDK_PED_SUCCESS) { //TODO }</pre>				

9.30 MfSdkPedCheckCardOnce

Prototype	LIB_EXPORT s32 MfSdkPedCheckCardOnce(void)		
Function	Use the external pinpad to check card		
Params	in	Nothing	
	out	Nothing	
	return	0	no card
		1	icc card
		2	rfid cad
		other	fail
remark			
demo	<pre>s32 ret = MfSdkPedCheckCardOnce(); if(ret == 1) { //ICC card }</pre>		

	}
--	---

9.31 MfSdkPedIsWithPinpad

Prototype	LIB_EXPORT s32 MfSdkPedIsWithPinpad(s32 timeoutMs)				
Function	Whether the terminal has external pinpad.				
Params	in	s32 timeoutMs	timeout ms		
	out	Nothing			
return	1	Connect the external pinpad			
	0	External pinpad is not connected			
remark					
demo	<pre>s32 ret = MfSdkPedIsWithPinpad(3000); if(ret == 1) { //Connect the external pinpad }</pre>				

9.32 MfSdkPedExPinpadUpdate

Prototype	s32 MfSdkPedExPinpadUpdate(MfSdkPedPinpadUpdateCb cb)				
Function	Update the external pinpad app.The pinpad app path must be in data/pinpad.bin				
Params	in	MfSdkPedPinpadU	Set the callback for the update process(500ms pdateCb cb call once)		
	out	Nothing			
return	For details, see MfSdkPedRet_E				
remark					
demo	<pre>static s32 AppPedPinpadUpdateCb(MfSdkPedPinpadUpdateStatus_E status, s32 total, s32 updatedSize, u32 time) { return 0; } s32 ret = MfSdkPedExPinpadUpdate(AppPedPinpadUpdateCb); If(ret == MFSDK_PED_SUCCESS)</pre>				

	<pre>{ //TODO }</pre>
--	-----------------------

9.33 MfSdkPedGetExPinpadVersion

Prototype	s32 MfSdkPedGetExPinpadVersion(s8 *buf, s32 bufSize)						
Function	Get the version of the external pinpad						
Params	<table border="1"> <tr> <td>in</td> <td>bufSize</td> <td>Version buff size</td> </tr> <tr> <td>out</td> <td>buf</td> <td>Version buff</td> </tr> </table>	in	bufSize	Version buff size	out	buf	Version buff
in	bufSize	Version buff size					
out	buf	Version buff					
return	For details, see MfSdkPedRet_E						
remark							
demo	<pre>s8 buf[20] = {0}; s32 ret = MfSdkPedGetExPinpadVersion(buf,20); If(ret == MFSDK_PED_SUCCESS) { //TODO }</pre>						

9.34 MfSdkPedGetExPinpadInfo

Prototype	LIB_EXPORT s32 MfSdkPedGetExPinpadInfo(MfSdkPedPinpadInfo_T *info)				
Function	Get the info of the external pinpad				
Params	<table border="1"> <tr> <td>in</td> <td>nothing</td> </tr> <tr> <td>out</td> <td>info pinpad info</td> </tr> </table>	in	nothing	out	info pinpad info
in	nothing				
out	info pinpad info				
return	For details, see MfSdkPedRet_E				
remark					
demo	<pre>MfSdkPedPinpadInfo_T pinfo = {0}; s32 ret = MfSdkPedPinpadInfo_T(&pinfo); If(ret == MFSDK_PED_SUCCESS) { //TODO }</pre>				

9.35 MfSdkPedSetPedPinMod

Prototype	LIB_EXPORT s32 MfSdkPedSetPedPinMod(s32 min, s32 max)				
Function	Set the external pinpad pin				
Params	in	s32 min	pin min len		
		s32 max	pin max len		
	out	Nothing			
return	For details, see MfSdkPedRet_E .				
remark					
demo	<pre>s32 ret = MfSdkPedSetPedPinMod(4,6); if(ret == MFSDK_PED_SUCCESS) { //TODO} }</pre>				

9.36 MfSdkPedGetPin

Prototype	LIB_EXPORT s32 MfSdkPedGetPin(s32 *len, s8 *pinBuf)		
Function	Gets the pin of the external pinpad		
Params	in	Nothing	
		s32 *len	Enter the pin length
	out	s8 *pinBuf	pin
return	For details, see MfSdkPedPinpadStatus_E		
remark			
demo	<pre>s8 pinBuf[10]={0}; s32 pinLen=0; s32 ret=0; ret = MfSdkPedGetPin(&pinLen,pinBuf); if(ret == MFSDK_PED_PINPAD_PRESS_OK) { //pinpad press OK }</pre>		

9.37 MfSdkPedTR31LoadKBPK

Prototype	s32 MfSdkPedTR31LoadKBPK(s32 gid, u8 *kbpk, u32 kbdkLen)	
Function	Load TR-31 clear-text KBPK	
Params	in	gid key index 0-99
	in	kbpk kbpk value
	in	kbdkLen kbdk length
	out	Nothing
return	For details, see MfSdkPedPinpadStatus_E	
remark		
demo	<pre>s32 ret=0; u8 kbpk[] = { 0x89,0xE8,0x8C,0xF7,0x93,0x14,0x44,0xF3, 0x34,0xBD,0x75,0x47,0xFC,0x3F,0x38,0x0C }; ret = MfSdkPedTR31LoadKBPK(0, kbpk, sizeof(kbpk)); if(ret == MFSDK_PED_SUCCESS) { //load success }</pre>	

9.38 MfSdkPedDukptLoadEncryptedKeyByTR31

Prototype	s32 MfSdkPedDukptLoadEncryptedKeyByTR31(MfSdkPedTr31KeyType_E type, s32 gid, u8 *keyblock, u32 keyblockLen)	
Function	Load cipher-text dukpt bdk/ipek by TR-31	
Params	in	type (0 - ipek, 1 - bdk)
	in	gid key index 0-99
	in	keyblock keyblock value
	in	keyblockLen keyblock length
out	Nothing	
return	For details, see MfSdkPedPinpadStatus_E	

remark	
demo	<pre>s32 ret=0; u8* keyblock = "B0080B1TX00N0000D94B387D9FACD303A6AEE1DF9CECB7F8FA3D314DB43F7C0EDCBC62 E94412D427"; ret = MfSdkPedDukptLoadEncryptedKeyByTR31(MFSKDK_PED_TR31_TYPE_IPEK, 1, keyblock, strlen(keyblock)); if(ret == MFSDK_PED_SUCCESS) { //load success }</pre>

9.39 MfSdkPedDukptLoadEncryptedKeyByTR31A

Prototype	s32 MfSdkPedDukptLoadEncryptedKeyByTR31A(MfSdkPedTr31KeyT ype_E type, s32 gid, u8 *keyblock, u32 keyblockLen, u8 *pKsn ,s32 ksnLength,u8 *kvc ,s32 kvcLenth)
Function	Load cipher-text dukpt bdk/ipek by TR-31
Params	in
	type (0 - ipek, 1 - bdk)
	gid key index 0-99
	keyblock keyblock value
	keyblockLen keyblock length
	pKsn
	ksnLength
out	kvcLenth
	kvc
return	For details, see MfSdkPedPinpadStatus_E
remark	Note pKsn != NULL && ksnLength > 0 will load pKsn
demo	

9.40 MfSdkPedMkskSaveEncryptedKeyByTR31

Prototype	s32 MfSdkPedMkskSaveEncryptedKeyByTR31(s32 type, u32 gid, u8 *keyblock, u32 keyblockLen ,u8 *kvc ,s32 kvcLenth)
Function	Load cipher-text mk/wk by TR-31

Params	in	type	MFSDK_MKSK_MAINKEY_TYPE MFSDK_MKSK_PINENC_TYPE MFSDK_MKSK_MACENC_TYPE MFSDK_MKSK_MAGDEC_TYPE MFSDK_MKSK_TRANSKEY_TYPE
		gid	key index 0-99
		keyblock	keyblock value
		keyblockLen	keyblock length
		kvcLenth	kvc length
	out	kvc	kvc buff
return		For details, see MfSdkPedPinpadStatus_E	
remark			
demo		<pre>s32 ret=0; u8 kvc[32] = { 0 }; u8* keyblock = "B0080B1TX00N0000D94B387D9FACD303A6AEE1DF9CECB7F8FA3D314DB43F7C0EDCBC62 E94412D427"; ret = MfSdkPedMkskSaveEncryptedKeyByTR31(MFSDK_MKSK_PINENC_TYPE, 1, keyblock, strlen(keyblock), kvc, sizeof(kvc)); if(ret == MFSDK_PED_SUCCESS) { //load success }</pre>	

9.41 MfSdkPedSetTransKey

Prototype	s32 MfSdkPedSetTransKey(s32 gid, s8 *key)				
Function	Save the mksk trans key				
Params	in	gid	max 100 group (0 ~ 99)		
		key	trans key		
	out	nothing			
return	For details, see MfSdkPedRet_E				
remark					
demo					

9.42 MfSdkPedGetTransKeyKvc

Prototype	s32 MfSdkPedGetTransKeyKvc(s32 gid, s8* kvcBuf, s32 kvcBufLen)		
Function	Save the mksk trans key		
Params	in	gid	max 100 group (0 ~ 99)
		kvcBufLen	kvc buffer length
	out	kvcBuf	kvc(Length 4 bytes)
return	For details, see MfSdkPedRet_E		
remark			
demo			

9.43 MfSdkPedSaveEncryptedMKByTransKey

Prototype	s32 MfSdkPedSaveEncryptedMKByTransKey(u32 gid, u8* key, MfSdkPedDesMod_E mode, u8* kvc)		
Function	Save the encrypted main key by trans key		
Params	in	gid	max 100 group (0 ~ 99)
		key	encrypted main key by trans key
		mode	des mode(see 'MfSdkPedDesMod_E' enum)
	out	kvc	kvc(Length 4 bytes)
return	For details, see MfSdkPedRet_E		
remark			
demo			

9.44 MfSdkPedDeleteTransKey

Prototype	s32 MfSdkPedDeleteTransKey(s32 gid)		
Function	Delete the mksk trans key		
Params	in	gid	max 100 group (0 ~ 99)

	out	nothing
return		For details, see MfSdkPedRet_E
remark		
demo		

9.45 MfSdkPedRebootCmd

Prototype		s32 MfSdkPedRebootCmd()
Function		Reboot the external pinpad
Params	in	nothing
	out	nothing
return		For details, see MfSdkPedRet_E
remark		
demo		

9.46 MfSdkPedGotoMainPage

Prototype		s32 MfSdkPedGotoMainPage()
Function		External pinpad Back to the main page
Params	in	nothing
	out	nothing
return		For details, see MfSdkPedRet_E
remark		
demo		

9.47 MfSdkPedAesSavePlaintextKey

Prototype	s32 MfSdkPedAesSavePlaintextKey(s32 type, s32 gid, const u8 * key,s32 length, u8*kvc)
------------------	---

Function		Save the aes key
Params	in	type MFSDK_MKSK_AES_KEY_TMK - MFSDK_MKSK_AES_KEY_TMK2_MAG
		gid 0 - 49
		key keyblock value
		length keyblock length
	out	kvc
return		For details, see MfSdkPedRet_E .
remark		
demo		

9.48 MfSdkPedTr31LoadAesKey

Prototype		s32 MfSdkPedTr31LoadAesKey(s32 gid, s32 keyType,const u8* data, s32 size, u8 checkvalue[4])
Function		Three-level key system
Params	in	gid 0 - 49
		keyType MFSDK_MKSK_AES_KEY_TMK - MFSDK_MKSK_AES_KEY_TMK2_MAG
		data
		size
	out	checkvalue
return		For details, see MfSdkPedRet_E .
remark		
demo		

9.49 MfSdkPedMkSkAesRun

Prototype		s32 MfSdkPedMkSkAesRun(s32 type, s32 gid, MfSdkPedMod_E mode, u8 *ind, s32 size, u8 iv[16], u8 *outd, MfSdkPedDesMod_E desMode)
Function		use key aes operation
Params	in	type key type(0x08 -

		MFSDK_MKSK_AES_KEY_PINENC, 0x09 - MFSDK_MKSK_AES_KEY_MACENC, 0x0A - MFSDK_MKSK_AES_KEY_MAGENC ... MFSDK_MKSK_AES_KEY_TMK2_MAG)
	gid	key grouping,max 50 group (0 - 49)
	mode	mode(see 'MfSdkPedMod_E' enum)
	ind	raw data
	size	data length (16-bytes multiple)
	iv	initialization vector
	desMode	des mode(see 'MfSdkPedDesMod_E' enum)
out	outd	calculation results
return	For details, see MfSdkPedRet_E .	
remark		
demo		

10 Communication module

10.1 Module description

This module mainly includes communication APIs.

10.2 Module structure declaration

```
typedef struct
{
    char ip[20];      /*IP address*/
    char gateway[30]; /*Local gateway*/
    char mask[30];    /*Local subnet mask*/
    char dns[30];     /*DNS*/
}MfSdkCommLanCfg_T;

typedef st_wifi_ap_list MfSdkCommWifiApList_T;
typedef st_apninfo_mcc MfSdkCommApnInfoMcc_T;
typedef st_apninfo MfSdkCommApnInfo_T;
```

10.3 Constant declarations

```
#define MFSDK_SYS_WIFI_DEFAULT_SAVE_PWD
"00000000000000000000"
#define MFSDK_SYS_WIFI_MAX_AP_COUNT 30
```

```
typedef enum
{
    MFSDK_COMM_SOCKET_INDEX_MIN = 0,
    MFSDK_COMM_SOCKET_INDEX_0 =
MFSDK_COMM_SOCKET_INDEX_MIN,
    MFSDK_COMM_SOCKET_INDEX_1,
    MFSDK_COMM_SOCKET_INDEX_2,
    MFSDK_COMM_SOCKET_INDEX_3,
    MFSDK_COMM_SOCKET_INDEX_4,
    MFSDK_COMM_SOCKET_INDEX_MAX
}MfSdkCommSocketIndex_E;

typedef enum
{
    MFSDK_COMM_NET_ONLY_WIRELESS = 0,           // only wireless 0
    MFSDK_COMM_NET_ONLY_WIFI,                   // only wifi
    MFSDK_COMM_NET_ONLY_WIRELESS_1,             // only
wireless 1 (Device not supported)
    MFSDK_COMM_NET_ONLY_ETHERNET,                // ETHERNET
    MFSDK_COMM_NET_FIRST_WIRELESS,              // wireless
priority
    MFSDK_COMM_NET_FIRST_WIFI,                  // wifi priority
}MfSdkCommNetSelect_E;

typedef MfSdkCommNetSelect_E MfSdkCommMode_E;

typedef enum
{
    MFSDK_COMM_UART_COM0 = 0,
    MFSDK_COMM_UART_COM1,
    MFSDK_COMM_UART_COM2,
    MFSDK_COMM_UART_COM3,
    MFSDK_COMM_UART_COM4,
    MFSDK_COMM_UART_COM5,
    MFSDK_COMM_UART_COM6,
    MFSDK_COMM_UART_COM7,
    MFSDK_COMM_UART_COM8,
    MFSDK_COMM_UART_COM9,
    MFSDK_COMM_UART_COM10,
    MFSDK_COMM_UART_COM11,
    MFSDK_COMM_UART_COM12,
    MFSDK_COMM_UART_COM13,
    MFSDK_COMM_UART_COM14,
```

```
MFSDK_COMM_UART_COM15,  
MFSDK_COMM_UART_COM16,  
MFSDK_COMM_UART_COM17,  
MFSDK_COMM_UART_COM18,  
MFSDK_COMM_UART_COM19,  
MFSDK_COMM_UART_COM20,  
MFSDK_COMM_UART_COM21,  
MFSDK_COMM_UART_COM22,  
MFSDK_COMM_UART_COM23,  
MFSDK_COMM_UART_COM24,  
MFSDK_COMM_UART_COM25,  
MFSDK_COMM_UART_COM26,  
MFSDK_COMM_UART_COM27,  
MFSDK_COMM_UART_COM28,  
MFSDK_COMM_UART_COM29,  
MFSDK_COMM_UART_COM30,  
}MfSdkCommUart_E;  
  
typedef enum  
{  
    MFSDK_COMM_RET_FAILED = -3, //failed  
    MFSDK_COMM_RET_BOUNDS = -2, //Array out-of-bounds  
    MFSDK_COMM_RET_PARM_ERROR = -1, //check param  
    MFSDK_COMM_RET_OK = 0,  
}MfSdkCommRet_E;  
  
typedef enum  
{  
    MFSDK_COMM_ATCCPIN_FAIL = 0, //Failure  
    MFSDK_COMM_ATCCPIN_LOCKED, //locked  
    MFSDK_COMM_ATCCPIN_NORMAL, //noraml  
    MFSDK_COMM_ATCCPIN_PUK //Puk  
}MfSdkCommAtcCpin_E;  
  
typedef enum  
{  
    MFSDK_COMM_WIFI_STATE_CONNECT_PROCESS = -999,  
    MFSDK_COMM_WIFI_STATE_DISCONNECT_PROCESS = -998,  
    MFSDK_COMM_WIFI_STATE_CONNECT_START = -997,  
    MFSDK_COMM_WIFI_STATE_NOT_EXIST = -2,  
    MFSDK_COMM_WIFI_STATE_PWD_ERROR = -1,  
    MFSDK_COMM_WIFI_STATE_DISCONNECT = 0,  
    MFSDK_COMM_WIFI_STATE_CONNECT = 1,
```

```
 }MfSdkCommWifiState_E;

typedef enum
{
    MFSDK_COMM_MOBILE_NO_SIGNAL = 0,
    MFSDK_COMM_MOBILE_1G, //The 1st Generation Mobile
Communication System
    MFSDK_COMM_MOBILE_2G, //The 2nd Generation Mobile
Communication System
    MFSDK_COMM_MOBILE_3G, //The 3rd Generation Mobile
Communication System
    MFSDK_COMM_MOBILE_4G, //The 4th Generation Mobile
Communication System
    MFSDK_COMM_MOBILE_5G, //RFU The 5th Generation Mobile
Communication System
    MFSDK_COMM_MOBILE_6G, //RFU The 6th Generation Mobile
Communication System
}MfSdkCommMobileGen_E;

typedef enum
{
    MFSDK_COMM_IPV4 = 1, //only ipv4
    MFSDK_COMM_IPV6, //only ipv6
    MFSDK_COMM_IPV4_IPV6, // both ipv4 and ipv6
}MfSdkCommIpVer_E;

typedef enum
{
    MFSDK_COMM_ATC_OFF = 0, // turn off
    MFSDK_COMM_ATC_ON, //turn on
}MfSdkCommAtcPowerState_E;

typedef enum
{
    MFSDK_COMM_SIM_PROC_PPP_NETWORK_OK = 0,
    MFSDK_COMM_SIM_PROC_NETWORK_CONNECTED,
    MFSDK_COMM_SIM_PROC_NETWORK_REGISTER_NETOWK,
    MFSDK_COMM_SIM_PROC_SIM_NORMAL,
    MFSDK_COMM_SIM_PROC_SWITCHING_SIM,
    MFSDK_COMM_SIM_PROC_NO_SIM_CARD,
}MfSdkCommSimProcStatus_E;
```

```

typedef enum
{
    MFSDK_COMM_IPTYPE_V4, // Get IP address type IPv4
    MFSDK_COMM_IPTYPE_V6, // Get IP address type IPv6
}MfSdkCommIpType_E;

```

10.4 MfSdkCommLinkState

Prototype		LIB_EXPORT MFSDKBOOL MfSdkCommLinkState(void)	
Function		Get net link state for both GPRS and Wifi	
Params	in	None	
	out	None	
return	1	Linked	
	0	Disconnect	
remark			
demo		MFSDKBOOL linkState = MfSdkCommLinkState();	

10.5 MfSdkCommGetNetMode

Prototype		LIB_EXPORT MfSdkCommMode_E MfSdkCommGetNetMode(void)	
Function		Get Comm mode, Ref.MfSdkCommMode_E	
Params	in	None	
	out	None	
return		NetMode	Ref.MfSdkCommMode_E
remark			
demo		s32 netMode = MfSdkCommGetNetMode();	

10.6 MfSdkCommAtcCell

Prototype	LIB_EXPORT s32 MfSdkCommAtcCell(s32 index)
------------------	--

Function	get 1st net registered cell	
Params	in	index
	out	None
return	Cell ID	
remark		
demo		

10.7 MfSdkCommAtcCellInfor

Prototype	LIB_EXPORT s32 MfSdkCommAtcCellInfor(s32 *cid, s32 size, s32 *num)	
Function	get net registered cell	
Params	in	cid buffer
		size buffer size
out	num	
return	MFSDK_COMM_RE T_OK Success	
	Other Fail	
remark		
demo		

10.8 MfSdkCommAtcCpin

Prototype	LIB_EXPORT MfSdkCommAtcCpin_E MfSdkCommAtcCpin(s32 index)	
Function	get net registered cell	
Params	in	index 0~1
	out	None
return	MFSDK_COMM_ATCCPIN_FAILED Fail	
	MFSDK_COMM_ATCCPIN_LOCKED Locked	
	MFSDK_COMM_ATCCPIN_NORMAL Normal	

	RMAL
	MFSDK_COMM_ATCCPIN_PU Puk K
remark	
demo	

10.9 MfSdkCommAtcGetLocallp

Prototype	LIB_EXPORT s32 MfSdkCommAtcGetLocallp(s8* ip)		
Function	Get local ip		
Params	in	None	
	out		ip
return	MFSDK_COMM_RE Success T_OK		
		Other	Fail
remark			
demo	s8 ip[32] = {0}; s32 ret = MfSdkCommAtcGetLocallp(ip);		

10.10 MfSdkCommAtclccid

Prototype	LIB_EXPORT const s8* MfSdkCommAtclccid(s32 index)				
Function	Get index Integrate circuit card identity value				
Params	in	index	0~1		
	out	None			
return	Icc ID				
remark					
demo					

10.11 MfSdkCommAtcIimei

Prototype	LIB_EXPORT const s8* MfSdkCommAtcIimei(s32 index)		
Function	Get Module imei		
Params	in	index	0~1
	out	None	
return	imei value		
remark			
demo			

10.12 MfSdkCommAtcImsi

Prototype	LIB_EXPORT const s8* MfSdkCommAtcImsi(s32 index)		
Function	Get Module imsi		
Params	in	index	0~1
	out	None	
return	imsi value		
remark			
demo			

10.13 MfSdkCommAtcLac

Prototype	LIB_EXPORT s32 MfSdkCommAtcLac(s32 index)		
Function	Get net registered lac		
Params	in	index	GPRS/4G index 0-1
	out	None	
return	lac value		
remark			

demo	
------	--

10.14 MfSdkCommAtcGetMcc

Prototype		LIB_EXPORT s32 MfSdkCommAtcGetMcc(s32 index)	
Function		Get gprs MCC	
Params	in	index	use 0
	out	None	
return		lac value	
remark			
demo		s32 mcc = MfSdkCommAtcGetMcc(0);	

10.15 MfSdkCommAtcGetMnc

Prototype		LIB_EXPORT s32 MfSdkCommAtcGetMnc(s32 index)	
Function		Get gprs MNC	
Params	in	index	use 0
	out	None	
return		lac value	
remark			
demo		s32 mnc = MfSdkCommAtcGetMnc(0);	

10.16 MfSdkCommAtcLacInfor

Prototype		LIB_EXPORT s32 MfSdkCommAtcLacInfor(s32 *lac, s32 size, s32 *num)	
Function		Get net registered lac	
Params	in	lac	buffer
		size	buffer size
	out	num	lac num

return	MFSDK_COMM_RE	Success
	T_OK	
Other	Fail	
remark		
demo		

10.17 MfSdkCommAtcSignal

Prototype	LIB_EXPORT s32 MfSdkCommAtcSignal(s32 index)	
Function	Get Module signal	
Params	in	index GPRS/4G index 0-1
	out	None
return	0	Unregistered
	1 - 4	Signal, e.g. 1:1 grid signal
remark		
demo		

10.18 MfSdkCommGetAtcGeneration

Prototype	LIB_EXPORT MfSdkCommMobileGen_E MfSdkCommGetAtcGeneration(s32 index)	
Function	Get the atc generation	
Params	in	index sim index 0-1 (Single sim card select 0)
	out	None
return	Ref. MfSdkCommMobileGen_E	
remark		
demo		

10.19 MfSdkCommGetAtcPower

Prototype	LIB_EXPORT MfSdkCommAtcPowerState_E MfSdkCommGetAtcPower(void)
------------------	---

Function		Get the atc power
Params	in	None
	out	None
return		Ref. MfSdkCommAtcPowerState_E
remark		
demo		

10.20 MfSdkCommAtcSendCmd

Prototype		LIB_EXPORT s32 MfSdkCommAtcSendCmd(s8 * cmd,s8 * RecvData,s32 RecvSize,s32 timeout,s32 count)
Function		Send and recv AT commend (4G module)
Params	in	cmd AT cmd
		RecvSize size of recv buff
		timeout Timeout unit: ms
		count resend count
	out	RecvData recv buff
return		0 success
		other fail
remark		
demo		

10.21 MfSdkCommGetNetSelect

Prototype		LIB_EXPORT MfSdkCommNetSelect_E MfSdkCommGetNetSelect(void)
Function		Get mode of wifi or gprs or the Priority
Params	in	None
	out	None
return		0 WIRELESS
		1 WIFI
		Other Ref.MfSdkCommNetSelect_E

remark	
demo	

10.22 MfSdkCommGetOperateId

Prototype	LIB_EXPORT s32 MfSdkCommGetOperateId(void)	
Function	Read the id of the working sim card(Only devices with two sim cards are supported)	
Params	in	None
	out	None
	return	0 SIM 1 1 SIM 2 Other Fail
remark		
demo		

10.23 MfSdkCommGetWifiPower

Prototype	LIB_EXPORT s32 MfSdkCommGetWifiPower(void)	
Function	Get the WiFi power	
Params	in	None
	out	None
	return	0 Power OFF 1 Power ON
remark		
demo		

10.24 MfSdkCommGsmGetSignal

Prototype	s32 MfSdkCommGsmGetSignal(void)
------------------	---------------------------------

Function	Get gsm signal	
Params	in	None
	out	None
return		
remark		
demo		

10.25 MfSdkCommHttpDownload

Prototype	LIB_EXPORT s32 MfSdkCommHttpDownload(s8 *url, s8*fullpathfilename, s32 iscontinue, s32 nRetry)	
Function	HTTP download	
Params	in	url url address
		fullpathfilename The full name of the downloaded file
		iscontinue 1-sequel 0-download again
		nRetry retry count
	out	None
return		MFSDK_COMM_RE Success
		T_OK
		Other Fail
remark		
demo		

10.26 MfSdkCommMbedtlsInit

Prototype	LIB_EXPORT s32 MfSdkCommMbedtlsInit(s32 useSession, s32 logLevel)	
Function	if you use mbedtls ,need init mbedtls	
Params	in	useSession
		logLevel
	out	None
return		MFSDK_COMM_RE Success
T_OK		

	Other	Ref. MfSdkCommRet_E
remark		
demo		

10.27 MfSdkCommNetLink

Prototype		LIB_EXPORT s32 MfSdkCommNetLink(void * pfunc, char * apn, s32 timeover)
Function		Connect Network
Params	in	pfunc Callback
		apn GPRS apn
		timeover Connection timeout
return	out	None
	MFSDK_COMM_RE	Success
		T_OK
remark	Other	Fail
demo		

10.28 MfSdkCommNetLinkWithUserInfo

Prototype		LIB_EXPORT s32 MfSdkCommNetLinkWithUserInfo(char * apn, char *user, char *pwd)
Function		Connect Network
Params	in	apn GPRS apn
		user GPRS apn user id
		pwd GPRS apn user password
return	out	None
	MFSDK_COMM_RE	Success
		T_OK
remark	Other	Fail
demo		

10.29 MfSdkCommNetUnlink

Prototype	LIB_EXPORT s32 MfSdkCommNetUnlink(void)		
Function	Disconnect from the network		
Params	in	None	
	out	None	
return		MFSDK_COMM_RE	Success
		T_OK	
remark		Other	Fail
demo			

10.30 MfSdkCommSetApMode

Prototype	LIB_EXPORT s32 MfSdkCommSetApMode(MfSdkCommIpVer_E mode)		
Function	set IPV version, should be called in main.c before network initial		
Params	in	mode	1:only IPV4; 2:only IPV6; 3:IPV4&IPV6
	out	None	
return		MFSDK_COMM_RET	Success
		T_OK	
remark		Other	Ref. MfSdkCommRet_E
demo			

10.31 MfSdkCommSetApnList

Prototype	LIB_EXPORT s32 MfSdkCommSetApnList(MfSdkCommApnInfo_T apn_list[], s32 ncount)
Function	

Params	in	apn_list[]	APN operator corresponding list		
		ncount	APN count		
	out	None			
return	MFSDK_COMM_RE		Success		
	T_OK				
Other		Ref. MfSdkCommRet_E			
remark					
demo					

10.32 MfSdkCommSetApnListMcc

Prototype	LIB_EXPORT s32 MfSdkCommSetApnListMcc(MfSdkCommApinfoMcc_T*apnlistMc c, s32 count)				
	Set APN MCC list.				
Params	in	apn_list[]	APN operator corresponding list		
		ncount	APN count		
	out	None			
return	MFSDK_COMM_RE		Success		
	T_OK				
Other		Ref. MfSdkCommRet_E			
remark					
demo					

10.33 MfSdkCommSetAtcPower

Prototype	s32 MfSdkCommSetAtcPower(MfSdkCommAtcPowerState_E flag)		
	Set the atc power		
Params	in	flag	0 - Turn off atc, 1 - Turn on atc
	out	None	
return	MFSDK_COMM_RE		Success
	T_OK		
Other		Ref. MfSdkCommRet_E	

remark	
demo	

10.34 MfSdkCommSetInitApn

Prototype		LIB_EXPORT s32 MfSdkCommSetInitApn(s8 *apn, s8 *user, s8 *pwd)		
Function		set gprs apn		
Params	in	apn	GPRS APN	
		user	GPRS USER	
		pwd	GRPS PASSWORD	
out		None		
return		MFSDK_COMM_RET_T_OK	Success	
		Other	Ref. MfSdkCommRet_E	
remark				
demo				

10.35 MfSdkCommSetNetMode

Prototype		LIB_EXPORT s32 MfSdkCommSetNetMode(s32 mode)	
Function		Switch network switching mode	
Params	in	mode	Ref. MfSdkCommNetSelect_E
	out	None	
return		MFSDK_COMM_RET_T_OK	Success
		Other	Ref. MfSdkCommRet_E
remark			
demo			

10.36 MfSdkCommSetNetSelect

Prototype		LIB_EXPORT s32 MfSdkCommSetNetSelect(MfSdkCommNetSelect_E index)	
Function			
Params	in	index	Ref. MfSdkCommNetSelect_E
	out	None	
return	MFSDK_COMM_RE	Success	
	T_OK		
remark	Other	Ref. MfSdkCommRet_E	
demo			

10.37 MfSdkCommSetWifiName

Prototype		LIB_EXPORT s32 MfSdkCommSetWifiName(s32 mode)	
Function		set wifi name, (WiFi version V5.1.2 and above support modify the wifi name)	
Params	in	mode	mode = 0: KM_AP, default: KM_(SN)
	out	None	
return	MFSDK_COMM_RE	Success	
	T_OK		
remark	Other	Ref. MfSdkCommRet_E	
demo			

10.38 MfSdkCommSocketClose

Prototype		LIB_EXPORT s32 MfSdkCommSocketClose(MfSdkCommSocketIndex_E index)
Function		Disconnect the server

Params	in	index	Sock index (0-4)
	out	None	
return	MFSDK_COMM_RET_T_OK Success		
	Other	Ref. MfSdkCommRet_E	
remark			
demo			

10.39 MfSdkCommSocketConnect

Prototype	LIB_EXPORT s32 MfSdkCommSocketConnect(MfSdkCommSocketIndex_E index, char * ip, s32 port, s32 timeout, void *func)		
Function	Connect to the server		
Params	in	index	Sock index (0-4)
		ip	IP address
		port	Port number
		timeout	time-out period unit:ms
		func	callback function
	out	None	
return	>=0 Success		
	<0 Fail		
remark			
demo			

10.40 MfSdkCommSocketConnectPriority

Prototype	LIB_EXPORT s32 MfSdkCommSocketConnectPriority(s32 mode)		
Function	Set connect priority		
Params	in	mode	mode=0(priority ipv4), mode=1(priority ipv6)
		out	None
return		MFSDK_COMM_RET_T_OK Success	

	Other	Ref. MfSdkCommRet_E
remark		
demo		

10.41 MfSdkCommSocketCreate

Prototype		LIB_EXPORT s32 MfSdkCommSocketCreate(MfSdkCommSocketIndex_E index)	
Function		Create socket	
Params	in	index	Sock index (0-4)
	out	None	
return		>=0	Success
		<0	Fail
remark			
demo			

10.42 MfSdkCommSocketFifoResize

Prototype		LIB_EXPORT s32 MfSdkCommSocketFifoResize(s32 index, s32 size)	
Function			
Params	in	index	Sock index (0-4)
		size	
out		None	
return		>=0	Success
		<0	Fail
remark			
demo			

10.43 MfSdkCommSocketRecv

Prototype		LIB_EXPORT s32 MfSdkCommSocketRecv(MfSdkCommSocketIndex_E index,

	unsigned char * buff, s32 len, u32 timeover)	
	Function Receive data	
Params	in	index Sock index (0-4)
		timeover Receive timeout
	out	buff Receive buffer
		len Receive length
return	>0	Receive length
	0	Timeout
	-1	Network disconnection
remark		
demo		

10.44 MfSdkCommSocketSend

Prototype	LIB_EXPORT s32 MfSdkCommSocketSend(MfSdkCommSocketIndex_E index, u8* buff, s32 size)	
Function	Send data	
Params	in	index Sock index (0-4)
		buff Send buff
		len Send length
	out	None
return	>=0	Success
	<0	Fail
remark		
demo		

10.45 MfSdkCommSslAuthMode

Prototype	LIB_EXPORT s32 MfSdkCommSslAuthMode(MfSdkCommSocketIndex_E index, s32 authMode)	
------------------	--	--

Function		Set the certificate verification mode.	
Params	in	index	Sock index (0-4)
			Ref.
		authMode	MBEDTLS_SSL_VERIFY_NONE MBEDTLS_SSL_VERIFY_OPTIONAL MBEDTLS_SSL_VERIFY_REQUIRED MBEDTLS_SSL_VERIFY_UNSET
	out	None	
return		MFSDK_COMM_RE	Success
		T_OK	
		Other	Ref. MfSdkCommRet_E
remark			
demo		<pre>s32 sock = MfSdkCommSocketCreate(MFSDK_COMM_SOCKET_INDEX_1); MfSdkCommSslAuthMode(sock,MBEDTLS_SSL_VERIFY_OPTIONAL); MfSdkCommSslInit(sock, "xxxx\\ca.pem", "xxxx\\cli.crt", "xxxx\\pri.key", 1); s32 ret = MfSdkCommSslConnect(sock, "a2d911mzqj2e50-ats.iot.ap-south-1.amazonaws.com", 8883,NULL); if(ret != MFSDK_COMM_RET_OK) {MfSdkCommSocketClose(sock); }</pre>	

10.46 MfSdkCommSslClose

Prototype		LIB_EXPORT s32 MfSdkCommSslClose(MfSdkCommSocketIndex_E index)	
Function		Close handle	
Params	in	index	Sock index (0-4)
	out	None	
return	MFSDK_COMM_RE		Success
	T_OK		
	Other	Ref. MfSdkCommRet_E	
remark			
demo		<pre>s32 sock = MfSdkCommSocketCreate(MFSDK_COMM_SOCKET_INDEX_1); MfSdkCommSslAuthMode(sock,MBEDTLS_SSL_VERIFY_OPTIONAL); MfSdkCommSslInit(sock, "xxxx\\ca.pem", "xxxx\\cli.crt", "xxxx\\pri.key", 1); s32 ret = MfSdkCommSslConnect(sock, "a2d911mzqj2e50-ats.iot.ap-south-1.amazonaws.com", 8883,NULL); if(ret != MFSDK_COMM_RET_OK) {MfSdkCommSocketClose(sock); }</pre>	

10.47 MfSdkCommSslConnect

Prototype		LIB_EXPORT s32 MfSdkCommSslConnect(MfSdkCommSocketIndex_E index, char * ip, s32 port, void *func)
Function		Connect to the server
Params	in	index Sock index (0-4)
		ip IP address
		port Port number
		func callback function int (*connect_server_func)(void);
	out	None
return		MFSDK_COMM_RET_ Success OK MFSDK_COMM_RET_F Fail FAILED
remark		
demo		<pre>s32 sock = MfSdkCommSocketCreate(MFSDK_COMM_SOCKET_INDEX_1); MfSdkCommSslAuthMode(sock,MBEDTLS_SSL_VERIFY_OPTIONAL); MfSdkCommSslInit(sock, "xxxx\\ca.pem", "xxxx\\cli.crt", "xxxx\\pri.key", 1); s32 ret = MfSdkCommSslConnect(sock, "a2d911mzqj2e50-ats.iot.ap-south-1.amazonaws.com", 8883,NULL); if(ret != MFSDK_COMM_RET_OK) {MfSdkCommSocketClose(sock); }</pre>

10.48 MfSdkCommSslInit

Prototype		LIB_EXPORT s32 MfSdkCommSslInit(MfSdkCommSocketIndex_E index, char * cacert, char * clientcert, char * clientkey, s32 level)
Function		
Params	in	index Sock index (0-4)
		cacert Cacert path
		clientcert Clientcert path
		clientkey Clientkey path
		level Log level default value is 1
	out	None
return		MFSDK_COMM_RET_ Success

	OK MFSDK_COMM_RET_F Fail AILED
remark	
demo	<pre>s32 sock = MfSdkCommSocketCreate(MFSDK_COMM_SOCKET_INDEX_1); MfSdkCommSslAuthMode(sock,MBEDTLS_SSL_VERIFY_OPTIONAL); MfSdkCommSslInit(sock, "xxxx\\ca.pem", "xxxx\\cli.crt", "xxxx\\pri.key", 1); s32 ret = MfSdkCommSslConnect(sock, "a2d911mzqj2e50-ats.iot.ap-south-1.amazonaws.com", 8883,NULL); if(ret != MFSDK_COMM_RET_OK) {MfSdkCommSocketClose(sock); }</pre>

10.49 MfSdkCommSslSetHostname

Prototype	LIB_EXPORT s32 MfSdkCommSslSetHostname(MfSdkCommSocketIndex_E index , const char * cn)		
Function	Set ssl host name		
Params	in	index	Sock index (1-4)
	out	cn	Host name
return	MFSDK_COMM_RE success T_OK		
	MFSDK_COMM_RE failed T_FAILED		
remark			
demo			

10.50 MfSdkCommSslMbedtls

Prototype	LIB_EXPORT s32 MfSdkCommSslMbedtls(s32 mbedtls)		
Function	Whether to use mbedtls.		
Params	in	mbedtls	1 - enable 0-disable
	out	None	

remark	
demo	MfSdkCommSslMbedtls(1);

10.51 MfSdkCommSslRecv

Prototype	LIB_EXPORT s32 MfSdkCommSslRecv(MfSdkCommSocketIndex_E index, char * pdata, s32 size)	
Function	Use new API MfSdkCommSocketRecv pls.	
Params	in	index Sock index (0-4) size
	out	pdata recv data
return		>=0 Success <0 Fail
remark		
demo		

10.52 MfSdkCommSslSend

Prototype	LIB_EXPORT s32 MfSdkCommSslSend(MfSdkCommSocketIndex_E index, char * pdata, s32 size)	
Function	Use new API MfSdkCommSocketSend pls.	
Params	in	index Sock index (0-4) size send data size pdata send data
	out	
return		
remark		
demo		

10.53 MfSdkCommSslSend2

Prototype	LIB_EXPORT s32 MfSdkCommSslSend2(s32 index, char * pdata, s32 size)		
Function	Use new API MfSdkCommSocketSend pls.		
Params	in	index Sock index (0-4)	
		size send data size	
		pdata send data	
out			
return			
remark			
demo			

10.54 MfSdkCommUartClear

Prototype	LIB_EXPORT s32 MfSdkCommUartClear(MfSdkCommUart_E nCom)	
Function	Clear uart fifo buff	
Params	in	nCom For details, see MfSdkCommUart_E.
	out	None
return	MFSDK_COMM_RE success T_OK	
	other fail	
remark		
demo	if(MfSdkCommUartClear(MFSDK_COMM_UART_COM10)==MFSDK_COMM_RE_T_OK) { //clear succ }	

10.55 MfSdkCommUartClose

Prototype		LIB_EXPORT s32 MfSdkCommUartClose(MfSdkCommUart_E nCom)	
Function		close uart port	
Params	in	nCom	For details, see MfSdkCommUart_E.
	out	None	
return		MFSRK_COMM_RE T_OK	success
other		fail	
remark			
demo		<pre>if(MfSdkCommUartClose(MFSRK_COMM_UART_COM10)==MFSRK_COMM_R ET_OK) { //close succ }</pre>	

10.56 MfSdkCommUartGetRxBufLength

Prototype		LIB_EXPORT s32 MfSdkCommUartGetRxBufLength(MfSdkCommUart_E nCom)	
Function		Get receive buff len	
Params	in	nCom	For details, see MfSdkCommUart_E.
	out	None	
return		>=0	receive buff len
remark			
demo		<pre>if(MfSdkCommUartGetRxBufLength(MFSRK_COMM_UART_COM10) > 0) { //TODO RECV }</pre>	

10.57 MfSdkCommUartOpen

Prototype	LIB_EXPORT s32 MfSdkCommUartOpen(MfSdkCommUart_E nCom, u32 nBaud,u32 nData,u32 nStop,u32 nParity)	
Function	open uart port	
Params	in	nCom For details, see MfSdkCommUart_E.
		nBaud Baud rate
		nData Data bits
		nStop Stop bits
		nParity Parity
	out	None
return	MFSDK_COMM_RET_T_OK success	
remark		
demo	<pre>s32 ret = MfSdkCommUartOpen(MFSDK_COMM_UART_COM10, 115200, 8, 0, 0); if(ret == MFSDK_COMM_RET_OK) { //TODO }</pre>	

10.58 MfSdkCommUartRecv

Prototype	LIB_EXPORT s32 MfSdkCommUartRecv(MfSdkCommUart_E nCom, u8* pBuffer, u32 nLength, s32 timeout)	
Function	receive uart port data	
Params	in	nCom For details, see MfSdkCommUart_E.
		nLength recv length
		timeout time-out period
	out	pBuffer recv buffer
return	>=0	receive data len
remark		
demo	<pre>u8 recvBuf[512] = {0}; if(MfSdkCommUartRecv(MFSDK_COMM_UART_COM10,recvBuf,512,10000)>0) {</pre>	

```
//receive succ
}
```

10.59 MfSdkCommUartSend

Prototype	LIB_EXPORT s32 MfSdkCommUartSend(MfSdkCommUart_E nCom, u8* pBuffer, u32 nLength)		
Function	send uart port data		
Params	in	nCom	For details, see MfSdkCommUart_E.
		pBuffer	send buffer
		nLength	send buffer length
	out	None	
return	>=0 send data len		
remark			
demo	<pre>u8 sendBuf[512] ="12345678"; if(MfSdkCommUartSend(MFSRK_COMM_UART_COM10,sendBuf,8)==8) { //send succ }</pre>		

10.60 MfSdkCommUartSetupComm

Prototype	LIB_EXPORT s32 MfSdkCommUartSetupComm(MfSdkCommUart_E nCom , u8* buffer , s32 size)		
Function	set uart comm buffer size. Generally do not set		
Params	in	nCom	For details, see MfSdkCommUart_E.
		buffer	buffer uart comm buffer handler
		size	buffer size
	out	None	
return	MFSRK_COMM_RET_OK success		
remark			
demo	<pre>u8 buf[512] ={4096}; if(MfSdkCommUartSetupComm(MFSRK_COMM_UART_COM10,buf,4096)==MFSRK_COMM_RET_OK)</pre>		

	{ //TODO }
--	------------------

10.61 MfSdkCommWifiClearListApNum

Prototype	LIB_EXPORT s32 MfSdkCommWifiClearListApNum(void)				
Function	Clear wifi ap list				
Params	<table border="1"> <tr> <td>in</td> <td>None</td> </tr> <tr> <td>out</td> <td>None</td> </tr> </table>	in	None	out	None
in	None				
out	None				
return	MFSDK_COMM_RESULT_OK success				
remark					
demo					

10.62 MfSdkCommWifiGetApMac

Prototype	LIB_EXPORT s8 *MfSdkCommWifiGetApMac(void)				
Function	Get Wifi AP MAC				
Params	<table border="1"> <tr> <td>in</td> <td>None</td> </tr> <tr> <td>out</td> <td>None</td> </tr> </table>	in	None	out	None
in	None				
out	None				
return	AP Mac				
remark					
demo					

10.63 MfSdkCommWifiGetChannel

Prototype	LIB_EXPORT s32 MfSdkCommWifiGetChannel(void)
Function	Get wifi channel

Params	in	None
	out	None
return	wifi channel	
remark		
demo		

10.64 MfSdkCommWifiGetLinkState

Prototype	LIB_EXPORT MfSdkCommWifiState_E MfSdkCommWifiGetLinkState(void)
Function	Get connection status
Params	in None
	out None
return	Ref. MfSdkCommWifiLinkState_E
remark	
demo	

10.65 MfSdkCommWifiGetLocalip

Prototype	s8* MfSdkCommWifiGetLocalip(void)
Function	Get Local IP
Params	in None
	out None
return	wifi ip
remark	
demo	

10.66 MfSdkCommWifiGetLocalMac

Prototype	LIB_EXPORT s8* MfSdkCommWifiGetLocalMac(void)
------------------	---

Function	Get Wifi Mac	
Params	in	None
	out	None
return	wifi mac	
remark		
demo		

10.67 MfSdkCommWifiGetRssi

Prototype	LIB_EXPORT s32 MfSdkCommWifiGetRssi(void)	
Function	Get Wifi Rssi	
Params	in	None
	out	None
return	wifi rssi	
remark		
demo		

10.68 MfSdkCommWifiGetSignal

Prototype	LIB_EXPORT s32 MfSdkCommWifiGetSignal(void)	
Function	Get Wifi Signal	
Params	in	None
	out	None
return	wifi signal	
remark		
demo		

10.69 MfSdkCommWifiGetSsid

Prototype	LIB_EXPORT s8* MfSdkCommWifiGetSsid(void)	
Function	Get Wifi Ssid	
Params	in	None
	out	None
return	wifi ssid	
remark		
demo		

10.70 MfSdkCommWifiLinkAp

Prototype	LIB_EXPORT s32 MfSdkCommWifiLinkAp(MfSdkCommWifiApList_T *apList, s8 *pwd)	
Function	Connect to WiFi	
Params	in	apList MfSdkCommWifiApList_T item
		pwd wifi password
out	None	
return	MFSDK_COMM_RE success	
	T_OK	
	other	failed
remark		
demo		

10.71 MfSdkCommWifiListAp

Prototype	LIB_EXPORT s32 MfSdkCommWifiListAp(MfSdkCommWifiApList_T *apList)	
Function	Get the router list	
Params	in	None

	out	apList	Router list data, The ap_list space is allocated by the caller with an array size of 10/30(Soundbox 10,traditional POS 30)	
	return	Number of routers		
	remark			
	demo			

10.72 MfSdkCommWifiListApQuit

	Prototype	LIB_EXPORT s32 MfSdkCommWifiListApQuit(void)
	Function	quit the router list
Params	in	None
	out	None
	return	MFSDK_COMM_RESULT_T_OK success
	remark	
	demo	

10.73 MfSDkCommWifiListNetWork

	Prototype	LIB_EXPORT s32 MfSDkCommWifiListNetWork(MfSdkCommWifiApList_T *apList)
	Function	Get the router save ap list
Params	in	None
	out	Router list data, The ap_list space is allocated by the caller with an array size of 10/30(Soundbox 10,traditional POS 30) apList
	return	
	remark	
	demo	

10.74 MfSdkCommWifiRemoveNetWorkAp

Prototype	LIB_EXPORT s32 MfSdkCommWifiRemoveNetWorkAp(s8* ssid)				
Function	Remove Wifi Ap				
Params	in	ssid	Wifi Ap		
	out	None			
return	MFSDK_COMM_RETURN_T_OK success				
remark					
demo					

10.75 MfSdkCommWifiSetPower

Prototype	LIB_EXPORT s32 MfSdkCommWifiSetPower(s32 flag)		
Function	Set the WiFi power		
Params	in	flag	0 - Turn off wifi power; 1 - Turn on wifi power
	out	None	
return	MFSDK_COMM_RETURN_T_OK Success		
	other	failed	
remark			

10.76 MfSdkCommWifiSetScan

Prototype	LIB_EXPORT s32 MfSdkCommWifiSetScan(s32 flag)		
Function	Start scan wifi		
Params	in	flag	0:stop scan 1:auto scan one time 2:scan immediately one time
	out	None	

return	MFSDK_COMM_RE T_OK success	
	other	failed
remark		

10.77 MfSdkCommWifiUnlinkAp

Prototype	LIB_EXPORT s32 MfSdkCommWifiUnlinkAp(s8* ssid)	
Function	Unlink wifi ap	
Params	in	ssid wifi ap
	out	None
return	MFSDK_COMM_RE T_OK success	
	other	failed
remark		

10.78 MfSdkCommSet4gMode

Prototype	LIB_EXPORT s32 MfSdkCommSet4gMode(void)	
Function	set net to 4G mode	
Params	in	None
	out	None
return	MFSDK_COMM_RE T_OK Success	
remark		
demo		

10.79 MfSdkCommWifiCheckState

Prototype	LIB_EXPORT s32 MfSdkCommWifiCheckState(void)	
------------------	--	--

Function	check wifi state		
Params	in	None	
	out	None	
return	1	Success	
	Other	Fail	
remark			
demo			

10.80 MfSdkCommWifiStartConfig

Prototype	LIB_EXPORT s32 MfSdkCommWifiStartConfig(void)		
Function	start config wifi		
Params	in	None	
	out	None	
return	MFSDK_COMM_RESULT_OK	Success	
remark			
demo			

10.81 MfSdkCommUartInit

Prototype	LIB_EXPORT void MfSdkCommUartInit(void)		
Function	init device uart		
Params	in	None	
	out	None	
return			
remark			
demo			

10.82 MfSdkCommLanCableCheck

Prototype	LIB_EXPORT s32 MfSdkCommLanCableCheck(void)		
Function	Whether the device is connected to a network cable		
Params	in	None	
	out	None	
return	0	unconnected	
	1	connected	
remark			
demo			

10.83 MfSdkCommLanSetDHCP

Prototype	LIB_EXPORT s32 MfSdkCommLanSetDHCP(int mod)				
Function	Set whether to enable DHCP				
Params	in	mod	1 enable, 0 disenble		
	out	None			
return	MFSDK_COMM_RET_E	Success T_OK			
	Other	Ref. MfSdkCommRet_E			
remark					
demo					

10.84 MfSdkCommLanIsDHCP

Prototype	LIB_EXPORT s32 MfSdkCommLanIsDHCP()		
Function	Whether to enable DHCP		

Params	in	None
	out	None
return	0	disable
	1	enable
	Other	Ref. MfSdkCommRet_E
remark		
demo		

10.85 MfSdkCommLanCfg

Prototype	LIB_EXPORT void MfSdkCommLanCfg(const MfSdkCommLanCfg_T *lanCfg)		
	Configuring Ethernet		
Params	in	lanCfg	Configuring Ethernet
	out	None	
return	Nothing		
remark			
demo			

10.86 MfSdkCommGetSwitchSimProcStatus

Prototype	LIB_EXPORT MfSdkCommSimProcStatus_E MfSdkCommGetSwitchSimProcStatus()		
	get the status of the sim card switchover		
Params	in	None	
	out	None	
return	For details, see MfSdkCommSimProcStatus_E		
remark			
demo			

10.87 MfSdkCommSetOperateIdTask

Prototype		LIB_EXPORT s32 MfSdkCommSetOperateIdTask(s32 val)	
Function		set the id of the working sim card(nonblocking)(Only devices with two sim cards are supported)	
Params	in	value	0: sim 1, 1: sim 2
	out	None	
return		>=0	Success
		Other	Fail
remark			
demo			

10.88 MfSdkCommWifiPageInitMode

Prototype		LIB_EXPORT void MfSdkCommWifiPageInitMode(void* state,int mode)	
Function		init wifi logo	
Params	in	state	lv_obj_t*
		mode	logo color 0-black ,1-white
out		None	
return		None	
remark			
demo			

10.89 MfSdkCommWifiPageInit

Prototype		LIB_EXPORT void MfSdkCommWifiPageInit(void* obj, int align, int x_ofs, int y_ofs)	
Function		init wifi page.	
Params	in	obj	lv_obj_t*

		align	ref. lv_align_t
		x_ofs	x offset
		y_ofs	y offset
	out	None	
	return	None	
	remark		
	demo		

10.90 MfSdkCommAtcPageInit

Prototype	LIB_EXPORT void MfSdkCommAtcPageInit(void* obj, int align, int x_ofs, int y_ofs)		
Function	init gprs page		
Params	in	obj	lv_obj_t*
		align	ref. lv_align_t
		x_ofs	x offset
		y_ofs	y offset
	out	None	
	return	None	
	remark		
	demo		

10.91 MfSdkCommAtcPageInitMode

Prototype	LIB_EXPORT void MfSdkCommAtcPageInitMode(void* state,int mode)		
Function	init GSM logo		
Params	in	state	lv_obj_t*
		mode	logo color 0-black ,1-white
	out	None	
	return	None	
	remark		
	demo		

10.92 MfSdkCommLanEnable

Prototype		LIB_EXPORT s32 MfSdkCommLanEnable();	
Function		enable Ethernet	
Params	in	None	
	out	None	
return		For details, see MfSdkCommRet_E	
remark			
demo			

10.93 MfSdkCommLanDisenable

Prototype		LIB_EXPORT s32 MfSdkCommLanEnable();	
Function		disenable Ethernet	
Params	in	None	
	out	None	
return		For details, see MfSdkCommRet_E	
remark			
demo			

10.94 MfSdkCommAtcGetIp

Prototype		LIB_EXPORT s32 MfSdkCommAtcGetIp(MfSdkCommIpType_E ipType, s8* ip ,s32 length)	
Function		Get local IP, default IPv4	
Params	in	ipType	IPv4/IPv6
		length	ip buffer size
	out	ip	ip buffer

return	> 0	ip length
	other	failed
remark		
demo		

10.95 MfSdkCommLanGetEthernetPower

Prototype	LIB_EXPORT s32 MfSdkCommLanGetEthernetPower(void);	
Function	Get Ethernet Power	
Params	in	None
	out	None
return	1	Turn on
	0	Turn off
remark		
demo		

10.96 MfSdkCommLanSetEthernetPower

Prototype	LIB_EXPORT s32 MfSdkCommLanSetEthernetPower(s32 flag);	
Function	Set Ethernet Power	
Params	in	flag 0 - Turn off , 1 - Turn on
	out	None
return	For details, see MfSdkCommRet_E	
remark		
demo		

10.97 MfSdkCommLanChipExist

Prototype	LIB_EXPORT s32 MfSdkCommLanChipExist()
------------------	--

Function	Check if the device has a WiFi chip	
Params	in	None
	out	None
return	1	Have WiFi chip
	0	No WiFi chip
remark		
demo		

10.98 MfSdkCommWifiChipExist

Prototype	LIB_EXPORT s32 MfSdkCommWifiChipExist()	
Function	Check if the device has a Ethernet chip	
Params	in	None
	out	None
return	1	Have Ethernet chip
	0	No Ethernet chip
remark		
demo		

10.99 MfSdkCommAtcSetNetMode

Prototype	LIB_EXPORT void MfSdkCommAtcSetNetMode(s32 mode)	
Function	Set network mode	
Params	in	mode 0 = "AUTO";1 = "only 2G";2 = "only 3G"; 3 = "only 4G";4 = "2G_3G";5 = "2G_3G_4G";
	out	None
return	None	
remark		
demo		

10.100 MfSdkCommAtcSendAtCmd

Prototype		LIB_EXPORT s32 MfSdkCommAtcSendAtCmd(s8* cmd, s32 timeover, s8* retstr, s32 len, s32 count)	
Function		Send AT command	
Params	in	cmd	at cmd
		timeover	timeover(ms)
		len	AT cmd len
		count	retry count
Params	out	retstr	Returned data
	return	0	Success
remark		Other	Failure
demo			

10.101 MfSdkCommLanGetIpAndMask

Prototype		LIB_EXPORT s32 MfSdkCommLanGetIpAndMask(s8* ip, s8* Mask);		
Function		Get Ethernet IP and mask		
Params	out	ip	ip info	
		Mask	mask info	
	in	None		
Params	return	0	Success	
		Other	Failure	
remark				
demo				

10.102 MfSdkCommLanGetGateway

Prototype	LIB_EXPORT s32 MfSdkCommLanGetGateway(s8* gateway)
------------------	--

Function	Gateway Gateway info		
Params	in	None	
	out	Gateway	Gateway info
return		0	Success
		Other	Failure
remark			
demo			

10.103 MfSdkCommLanGetDns

Prototype	LIB_EXPORT s32 MfSdkCommLanGetDns(s8 dnsArr[][64], s32 dnsArrCount);		
Function	Get Ethernet DNS		
Params	in	dnsArrCount	dns array count
	out	dnsArr	dns info
return		>0	Success,count of DNS
		Other	Failure
remark			

10.104 MfSdkCommLanGetMac

Prototype	LIB_EXPORT s32 MfSdkCommLanGetMac(s8* mac);		
Function	Get Ethernet mac		
Params	in	None	
	out	mac	mac info
return		0	Success
		Other	Failure
remark			
demo			

10.105 MfSdkCommConfigReset

Prototype	LIB_EXPORT void MfSdkCommConfigReset(void);	
Function	Reply to network connection status	
Params	in	None
	out	None
return	None	
remark		
demo		

10.106 MfSdkCommWifiStopConfig

Prototype	LIB_EXPORT void MfSdkCommWifiStopConfig(void);	
Function	WIFI stop config network	
Params	in	None
	out	None
return	None	
remark		
demo		

10.107 MfSdkCommWifiRestart

Prototype	LIB_EXPORT void MfSdkCommWifiRestart(void)	
Function	Restart the WiFi module only for ET389	
Params	in	None
	out	None
return	None	
remark		

demo	
------	--

10.108 MfSdkCommSetPingAddr

Prototype		LIB_EXPORT s32 MfSdkCommSetPingAddr(u8* addr);	
Function		Set ping address	
Params	in	addr	address.example:"www.baidu.com"
	out	None	
return		0 Success	
return		Other Failure	
remark			
demo			

10.109 MFSdkCommSocketGetModelType

Prototype		LIB_EXPORT int MFSdkCommSocketGetModelType(int socket_index);	
Function		Get current model type	
Params	in	socket_index	socket index
	out	None	
return		0 WIRELESS	
return		1 WIFI	
remark			
demo			

11 EMV module

11.1 Module description

This module mainly includes EMV setting.

11.2 Module structure declaration

```
typedef struct
{
    u8 cTranType;// 00 sale 09 cashback
    u8 szAmt [12+1];
    u8 szOtherAmt[12+1];
    u8 cReadCardMode;// refer to MfSdkCardMode . Can be combined ,
0x07 is all
    u8 cPinInput;           //
    u8 cPinMinLen;
    u8 cPinMaxLen;
    u8 cKeyPid//SEC_DUKPT_FIELD,SEC_MKSK_FIELD,SEC_FIXED_FIELD

    u8 cDukptPinIndex;
    u8 cDukptDataIndex;
    u8 cDesMode;           //DES_MODE_ECB,DES_MODE_CBC
    u8 cMKSKPinIndex;
    u8 cPinFormat; //refer to SEC_PIN_FORMAT in libapi_security.h
    u8 cBypassPin;
}sdk_read_card_in;

typedef struct
{
    u8 cCardType;
    u8 szPan[22];
    u8 szPinBlock[16+1];
    u8 szPinKSN[10+1];
    u8 szDataKSN[10+1];
    u8 szTrack2[SDK_TRACK_MAX_LENGTH];
    u8 cTrack2Len;
    u8 szTrack3[SDK_TRACK_MAX_LENGTH];
    u8 cTrack3Len;
    u8 cEmvClsMode;
    u8 szServiceCode[3+1];
    u8 cClsCvmMethod;
    u16 nErrCode;
}sdk_read_card_out;

typedef struct {
    u8 szRid[5];           //tag 9f06
    u8 cCapkIndex;          //tag 9f22
```

```

        u8 szCapkExpire[4];           //tag df05
        u8 cCapkHashFlag;            //tag df06
        u8 cCapkFlag;                //tag df07
        u8 szCapkMod[248];           //tag df02
        u8 cCapkModLen;              //szCAPKMod len
        u8 szCapkExponent[3];         //tag df04
        u8 cCapkExpLen;              //szCAPKExponent len
        u8 szCapkCheckSum3[20];       //tag df03
        u8 cCheckSumLen;             //szCAPKCheckSum3 len
    }MfSdkEmvCapkInfo_T;

typedef st_read_card_in  MfSdkEmvReadCardIn_T;
typedef st_read_card_out MfSdkEmvReadCardOut_T;
typedef card_magtek_track_info MfSdkEmvTrackInfo_T;
typedef AID_STRU MfSdkEmvAidSt_T;

```

11.3 Constant declarations

#define MODE_API_UNKNOW	0x00	///<
unknown api mode		
#define MODE_API_PBOC	0x01	///< pboc
#define MODE_API_VCPS	0x02	///< vcps
#define MODE_API_MSD	0x04	///< msd
#define MODE_API_AMEX	0x40	///< AMEX
#define MODE_API_M_CHIP	0x21	///< MasterCard
CHIP mode		
#define MODE_API_M_STRIPE	0x22	///< MasterCard
MagStripe mode		
#define MODE_API_R_LEGACY	0x23	///< RUPAY
LEGACY mode		
#define MODE_API_R_NON_LEGACY	0x24	///< RUPAY NON
LEGACY mode		
#define MODE_API_EMV_MODE	0x25	///< EMV_MODE
(for AMEX)		
#define MODE_API_MS_MODE	0x26	///< MS_MODE
(for AMEX)		
#define MODE_API_MOBILE_MODE	0x27	///<
mobile_MODE (for amex)		
// application TLV TAG		
#define APP_TAG_DF8A01_AIDOTHERTLV		
"\xFDF\x8A\x01"	// aid other tlv	

```
#define APP_TAG_DF8A02_FORCEONLINE
"\xDFl\x81\x02"          //0:no forced online; 1:forced online(TVR) 2:forced
online (request ARQC in case of TC)
#define DEF_TAG_AID_MCHIP_OTHER_PARAM
"\xDFl\x84\x06"          //AID other Contact
#define DEF_TAG_AID_RF_OTHER_PARAM
"\xDFl\x84\x07"          //AID other contactless
#define DEF_TAG_TAP_MODE           "\xDFl\x84\x08"
//tap mode (1-long tap  2-second tap)
#define DEF_TAG_CONTACTLESS_REFUN_CONFIG
"\xDFl\x84\x0A"          // Contactless Refund Config
#define APP_TAG_DF810C_KERNELID
"\xDFl\x81\x0C"          // Kernel ID
#define SDK_TRACK_MAX_LENGTH      144

enum
{
    SDK_QPBOC_VER=0,
    SDK_VISA_VER,
    SDK_MASTER_VER,
    SDK_AMEX_VER,
    SDK_DPAS_VER,
    SDK_RUPAY_VER,
}SDK_KERNEL_VER;
enum
{
    SDK_KERNELID_MASTER = 0x02,
    SDK_KERNELID_VISA,
    SDK_KERNELID_AMEX,
    SDK_KERNELID_JCB,
    SDK_KERNELID_DISCOVER,
    SDK_KERNELID_UNIONPAY,
    SDK_KERNELID_SIBS,
    SDK_KERNELID_PURE,
}SDK_KERNEL_ID;

enum
{
    MSG_SELECT_APP,
    MSG_ONLINE_PIN,
    MSG_OFFLINE_PIN,
    MSG_OFFLINE_PIN_RETRY_COUNT,
```

```
MFSDK_EMV_MSG_DISPLAY_CARD_NO, // display card no.  
MFSDK_EMV_MSG_SET_PUREAMT_BEFOREGPO,  
}CALLBACK_MSG;  
  
enum  
{  
    MFSDK_EMV_CARD_RET_QUIT, //< quit  
    MFSDK_EMV_CARD_RET_INPUT, //< input  
    MFSDK_EMV_CARD_MAGTEK, //< magstripe card  
    MFSDK_EMV_CARD_ICC, //< ICC  
    MFSDK_EMV_CARD_RFID, //< RF  
}MfSdkEmvReadCardMode_E;  
  
enum  
{  
    MFSDK_EMV_CARD_PROC_RET_TC = 0, //< TC (offline  
approve)  
    MFSDK_EMV_CARD_PROC_RET_ARQC = 1, //< ARQC(online  
require)  
    MFSDK_EMV_CARD_PROC_RET_AAC = -11, //< AAC(offline  
declined)  
    MFSDK_EMV_CARD_PROC_RET_TERM = -2, //< Terminate  
    MFSDK_EMV_CARD_PROC_RET_CANCEL = -3, // User cancel  
    MFSDK_EMV_CARD_PROC_RET_TIMEOUT = -4, //Timeout  
    MFSDK_EMV_CARD_PROC_RET_FORCEIC = -5, //Transaction  
force IC  
    MFSDK_EMV_CARD_PROC_RET_OTHER = -6, //Contactless  
turn to other interface  
    MFSDK_EMV_CARD_PROC_RET_FALLBACK = -7, // Fallback  
    MFSDK_EMV_CARD_PROC_RET_SEEPHONE = -8, // See  
Phone and Retry  
    MFSDK_EMV_CARD_PROC_RET_APPBLOCK = -9, //app block  
    MFSDK_EMV_CARD_PROC_RET_CARDBLOCK = -10, //Card block  
    MFSDK_EMV_CARD_PROC_RET_NOAPP = -12, //card  
without any application available  
    MFSDK_EMV_CARD_PROC_RET_ERR_POWERUP = -13, //card not  
responding or chip not present  
    MFSDK_EMV_CARD_PROC_RET_INVDATA = -14, //card  
behaves correctly but has invalid or inconsistent data.  
    MFSDK_EMV_CARD_PROC_RET_APPNAUT = -15, //card  
returned error 6985  
    MFSDK_EMV_CARD_PROC_RET_CAPK_NOFOUND = -16, //card  
CAPK not found
```

```

        MFSDK_EMV_CARD_PROC_RET_APDU_NORETURN = -17,
} MfSdkEmvCardProcRet_E;
enum {
    MFSDK_READ_CARD_MODE_MAG = 0x01,    ///< magstripe
    MFSDK_READ_CARD_MODE_IC = 0x02,    ///< ic
    MFSDK_READ_CARD_MODE_RF = 0x04    ///< rf
}MfSdkCardMode;

typedef int(*MfSdkEmvSelcAppDisplay)(MfSdkEmvAidSt_T *stICCAID,int
nAidNum,int *select_choic);

typedef int (*MfSdkEmvInputOffPin)(char *psCardNo,char *psAmt,char
cMsgType,char *psPin);

typedef int (*MfSdkEmvInputOnlinePin)(char *psCardNo,char *psAmt,char
*psPin);

typedef void (*MfSdkReadPage)(void);

typedef int (*MfSdkRuPay2ndPage)(void);

typedef int (*MfSdkDpas2ndPage)(void);
typedef int (*MfSdkPreprocessSetOtherDataCb)(u8*pOutData ,s32
iOutData);

```

11.4 MfSdkEmvKernelInit

Prototype	LIB_EXPORT void MfSdkEmvKernelInit(void)				
Function	Emv kernel init				
Param					
s	in Nothing				
	out Nothing				
return	<table border="0"> <tr> <td style="text-align: center;">< 0</td> <td style="text-align: center;">Failed</td> </tr> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">Success</td> </tr> </table>	< 0	Failed	0	Success
< 0	Failed				
0	Success				
remark					
demo	MfSdkEmvKernelInit()				

--	--

11.5 MfSdkEmvTerminalConfigInit

Prototype	LIB_EXPORT s32 MfSdkEmvTerminalConfigInit(u8* ConfigBuff,s32 BuffLen)
Function	Set emv terminal configuration
Params	in ConfigBuff: Terminal parameters(all in tlv format) BuffLen Length of configBuff
	out Nothing
return	< 0 Failed 0 Success
remark	
demo	

11.6 MfSdkEmvCardLoop

Prototype	LIB_EXPORT s32 MfSdkEmvCardLoop(s32 cardMode,s32 timeout)
Function	Loop detection card
Params	in CardMode 0x01:mag, 0x02:ICC,0x04:RFIC,0x07:All timeout Unit is seconds
	out Nothing
return	> 0 Ref. MfSdkCardMode
	0 No card
	-3 It means timeout.
	-4 Multiple cards
remark	
demo	s32 ret = MfSdkEmvCardLoop(0x01 0x02 0x04,60);

```

if(MFSDK_READ_CARD_MODE_MAG == ret){
//TODO magstripe
}
else if(MFSDK_READ_CARD_MODE_IC == ret){
//TODO contact
}
else if(MFSDK_READ_CARD_MODE_RF == ret){
//TODO contactless
}

```

11.7 MfSdkEmvCardProc

Prototype		LIB_EXPORT s32 MfSdkEmvCardProc(s32 ret,sdk_read_card_in st_in,u8* inBuff,s32 inLen,sdk_read_card_out * st_out)
Function		Card reading process
Params	in	ret cardType: return value of "MfSdkEmvCardLoop" st_in inbuff inLen
	out	st_out
return		
remark		
demo		

11.8 MfSdkEmvGetCard

Prototype	LIB_EXPORT s32 MfSdkEmvGetCard(s32 ret,u8* inBuff,u8*outBuff);
------------------	---

Function	Only for BC
Params	in ret inBuff
	out outBuff
	return None
remark	
demo	

11.9 MfSdkEmvGoOnChip

Prototype	LIB_EXPORT s32 MfSdkEmvGoOnChip(s32 ret,u8* inBuff,u8*outBuff);
Function	Only for BC
Params	in ret inBuff
	out outBuff
	return None
remark	
demo	

11.10 MfSdkEmvSetAid

Prototype	LIB_EXPORT s32 MfSdkEmvSetAid(u8* AidBuff,s32 BuffLen)
Function	Add one aid
Params	in AidBuff TLV hex format BuffLen
	out st_out
	return < 0 Failed 0 Success
remark	
demo	

--	--

11.11 MfSdkEmvDeleteOneAid

Prototype		LIB_EXPORT s32 MfSdkEmvDeleteOneAid(u8* Aid,u8 aidLength)
Function		delete one aid
Param s	in	Aid Aid buff
	out	aidLength None
return	< 0	Failed
	0	Success
remark		
demo		

11.12 MfSdkEmvClearAllAid

Prototype		LIB_EXPORT void MfSdkEmvClearAllAid(void);
Function		delete all aid
Param s	in	None
	out	None
return	< 0	Failed
	0	Success
remark		
demo		

11.13 MfSdkEmvGetAidNum

Prototype	LIB_EXPORT s32 MfSdkEmvGetAidNum(void);					
Function	The total number of aids					
Param s	in	None				
	out	None				
return		<table style="margin-left: auto; margin-right: auto;"> <tr> <td>>0</td> <td>aid total</td> </tr> <tr> <td>Other</td> <td>Fail</td> </tr> </table>	>0	aid total	Other	Fail
>0	aid total					
Other	Fail					
remark						
demo						

11.14 MfSdkEmvSetCapk

Prototype	LIB_EXPORT s32 MfSdkEmvSetCapk(u8 * CapkBuff,s32 BuffLen);					
Function	add one capk					
Param s	in	CapkBuff CapkBuff TLV format				
	out	None				
return		<table style="margin-left: auto; margin-right: auto;"> <tr> <td>0</td> <td>success</td> </tr> <tr> <td>Other</td> <td>Fail</td> </tr> </table>	0	success	Other	Fail
0	success					
Other	Fail					
remark						
demo						

11.15 MfSdkEmvDeleteAllCapk

Prototype	LIB_EXPORT s32 MfSdkEmvDeleteAllCapk(void);	
Function	delete all capk	
Param s	in	None
	out	None

return	0	success
	Other	Fail
remark		
demo		

11.16 MfSdkEmvGetCapkNum

Prototype	LIB_EXPORT s32 MfSdkEmvGetCapkNum(void);	
Function	The total number of capks	
Param s	in	None
	out	None
return	>=0	capk total
	Other	Fail
remark		
demo		

11.17 MfSdkEmvGetCapkByIndex

Prototype	LIB_EXPORT s32 MfSdkEmvGetCapkByIndex(MfSdkEmvCapkInfo_T* stCapk, s32 nRecNum);	
Function	get capk info by index	
Param s	in	nRecNum index
	out	stCapk capk info
return	=0	success
	Other	Fail
remark		
demo		

11.18 MfSdkEmvGetDataByTag

Prototype	LIB_EXPORT s32 MfSdkEmvGetDataByTag(u8* Tag,u8* Src,s32 ScrLen,u8* OutBuff,s32* OutLen);		
Function	Get tag data from TLV string(hex format)		
Params	in	Tag	Tag
		Src	Src
		ScrLen	Scr Len
	out	OutBuff	Out Buff
		OutLen	Out Buff Len
return	=0	success	
	Other	Fail	
remark			
demo			

11.19 MfSdkEmvGetKernelData

Prototype	LIB_EXPORT s32 MfSdkEmvGetKernelData(u8* Tag,s32* OutValueLen,u8* OutValue)		
Function	Get emv tag from kernel		
Params	in	Tag	
		OutValueLen	
	out	OutValue	
return	< 0	Failed	
	0	Success	
remark			
demo			

11.20 MfSdkEmvGetDataByTag

Prototype		LIB_EXPORT s32 MfSdkEmvGetDataByTag(u8* Tag,u8* Src,s32 ScrLen,u8* OutBuff,s32* OutLen)
Function		Get tag data from TLV string(hex format)
Params	in	Tag Src ScrLen
	out	OutBuff OutLen
return		< 0 Failed 0 Success
remark		
demo		

11.21 MfSdkEmvPackTLVData

Prototype		LIB_EXPORT s32 MfSdkEmvPackTLVData(u8* Tag,u8* TagValue,s32 ValueLen,u8* OutBuff,s32* OutLen)
Function		Packed TLV string to an array
Params	in	Tag TagValue ValueLen
	out	OutBuff OutLen
return		< 0 Failed 0 Success
remark		
demo		

--	--

11.22 MfSdkEmvSetKernelData

Prototype		LIB_EXPORT s32 MfSdkEmvSetKernelData(u8* Tag,u8* SetData,s32 DataLen,s32 bOverRide)	
Function		Get tag data from TLV string(hex format)	
Params	in	Tag	
		SetData	
Params	out	DataLen	
		bOverRide YES or No	
return		< 0 Failed 0 Success	
remark			
demo			

11.23 MfSdkEmvSetDRL

Prototype		LIB_EXPORT s32 MfSdkEmvSetDRL(TERMDRL stDRL)	
Function		Set visa and amex DRL config	
Params	in	stDRL	
		None	
return		< 0 Failed 0 Success	
remark			
demo			

11.24 MfSdkEmvClearDRLFile

Prototype		LIB_EXPORT s32 MfSdkEmvClearDRLFile()
Function		clear all DRL
Param s	in	None
	out	None
return	< 0	Failed
	0	Success
remark		
demo		

11.25 MfSdkEmvMatchErrCode

Prototype		LIB_EXPORT s32 MfSdkEmvMatchErrCode(u32 iErrcode)
Function		Match error code
Param s	in	iErrcode
	out	None
return	< 0	Failed
	0	Success
remark		
demo		

11.26 MfSdkEmvOnlineRespPack

Prototype		LIB_EXPORT s32 MfSdkEmvOnlineRespPack(s32 nOnlineRes,s8* sField39,u8* sField55,u8* EmvTag,u8* PackValue,s32* packLen)
Function		Process of emv online resp proc and pack tlv data
Param s	in	nOnlineRes 0--online success(Any return in the server is success) -1--online fail sField39 sField55 EmvTag
	out	PackValue packLen
return		< 0 Failed 0 Success
remark		
demo		

11.27 MfSdkEmvCardFree

Prototype		LIB_EXPORT s32 MfSdkEmvCardFree(s32 Type)
Function		Process of emv online resp proc and pack tlv data
Param s	in	Type 2:free icc card data; 3:free rfic card data
	out	None
return		< 0 Failed 0 Success
remark		
demo		

11.28 MfSdkEmvAddCardBlackList

Prototype		LIB_EXPORT s32 MfSdkEmvAddCardBlackList(BlackCard stBlackCard,s32 cCoverFlag)			
Function		Add one card black list			
Param s	in	stBlackCard			
	out	cCoverFlag			
return		None			
		<table> <tr> <td>< 0</td><td>Failed</td></tr> <tr> <td>0</td><td>Success</td></tr> </table>	< 0	Failed	0
< 0	Failed				
0	Success				
remark					
demo					

11.29 MfSdkEmvDelCardBlackList

Prototype		LIB_EXPORT s32 MfSdkEmvDelCardBlackList(BlackCard stBlackCard)				
Function		delete one card black list				
Param s	in	stBlackCard				
	out	None				
return		<table> <tr> <td>< 0</td><td>Failed</td></tr> <tr> <td>0</td><td>Success</td></tr> </table>	< 0	Failed	0	Success
< 0	Failed					
0	Success					
remark						
demo						

11.30 MfSdkEmvGetVersion

Prototype	LIB_EXPORT s32 MfSdkEmvGetVersion(s8 *Version)
------------------	---

Function	Get emv version		
Params	in	Version	Version string
	out	None	
return	< 0	Failed	
	0	Success	
remark			
demo			

11.31 MfSdkEmvGetEntryVersion

Prototype	LIB_EXPORT s32 MfSdkEmvGetEntryVersion(s8* Version)		
Function	Get emv entry version		
Params	in	Version	Version string
	out	None	
return	< 0	Failed	
	0	Success	
remark			
demo			

11.32 MfSdkEmvGetContactlessVersion

Prototype	LIB_EXPORT s32 MfSdkEmvGetContactlessVersion(s32 KernelType,s8* Version)		
Function	Get emv contactless version		
Params	in	Version	Version string
		KernelType:	refer to SDK_KERNEL_VER
return	out	None	
	< 0	Failed	
	0	Success	

remark	
demo	

11.33 MfSdkEmvSetCallBackFunction

Prototype		LIB_EXPORT void MfSdkEmvSetCallBackFunction(s32 (*callback)(s32 MsgType,u8* Indata,s32 InLen,u8* OutData,s32* Outlen))	
Function		Set emv callback function	
Params	in	callback	callback func
		MsgType	refer to CALLBACK_MSG
		Indata:	
		InLen	
	out	OutData	
		Outlen	
return		< 0	Failed
		0	Success
remark			
demo			

11.34 MfSdkEmvReadCardPage

Prototype		lv_obj_t*MfSdkEmvReadCardPage(lv_obj_t *parent,void*pfunc,MfSdkEmvReadCardIn_T *pCardIn,MfSdkEmvReadCardOut_T *pCardOut);	
Function		create read card page	
Params	in	parent	lvgl parent obj
		pCardIn	Card In parameter
	out	pfunc	callback

	pCardOut	Card out parameter
return	lv_obj_t*	lvgl page obj
remark		
demo		

11.35 MfSdkEmvSetSelectAppCallback

Prototype		void MfSdkEmvSetSelectAppCallback(MfSdkEmvSelcAppDisplay pFunc);	
Function		Mutil App select	
Params	in	pFunc	callback
	out	None	
return		None	
remark			
demo			

11.36 MfSdkEmvOfflinePinCallback

Prototype		void MfSdkEmvOfflinePinCallback(MfSdkEmvInputOffPin pFunc);	
Function		offline pin callback	
Params	in	pFunc	callback
	out	None	
return		None	
remark			
demo			

11.37 MfSdkEmvOnlinePinCallback

Prototype		void MfSdkEmvOnlinePinCallback(MfSdkEmvInputOnlinePin pFunc);	

Function	online pin callback		
Params	in	pFunc	callback
	out	None	
return	None		
remark			
demo			

11.38 MfSdkEmvSetReadPageCallback

Prototype	void MfSdkEmvSetReadPageCallback(MfSdkReadPage pFunc);		
Function	display read card processing		
Params	in	pFunc	callback
	out	None	
return	None		
remark			
demo			

11.39 MfSdkEmvSetRuPay2ndTapCallback

Prototype	void MfSdkEmvSetRuPay2ndTapCallback(MfSdkRuPay2ndPage pFunc);		
Function	second tap UI		
Params	in	pFunc	callback
	out	None	
return	None		
remark			
demo			

11.40 MfSdkEmvSetDpas2ndTapCallback

Prototype	void MfSdkEmvSetDpas2ndTapCallback(MfSdkDpas2ndPage pFunc);		
Function	second tap UI		
Params	in	pFunc	callback
	out	None	
return	None		
remark			
demo			

11.41 MfSdkEmvGetPageWin

Prototype	lv_obj_t* MfSdkEmvGetPageWin(void);		
Function	Get EMV lvgl page handler		
Params	in	None	
	out	None	
return	lv_obj_t* EMV lvgl page handler		
remark			
demo			

11.42 MfSdkEmvSetPreprocessOtherDataCallback

Prototype	void MfSdkEmvSetPreprocessOtherDataCallback(MfSdkPreprocessSetOtherDataCb pFuncCallback);		
Function	set contactless other data callback		
Params	in	pFunc	callback
	out	None	
return	None		
remark			

demo	
------	--

11.43 MfSdkEmvGetPageWinTip

Prototype	<code>lv_obj_t* MfSdkEmvGetPageWinTip(void);</code>		
Function	set contactless other data callback		
Params	in	pFunc	callback
	out	None	
return	None		
remark			
demo			

11.44 MfSdkEmvGetProclInfo

Prototype	<code>s32 MfSdkEmvGetProclInfo(s8* outBuf, s32 bufLen);</code>		
Function	Get read card information		
Params	in	bufLen	buff len.
	out	outBuf	buff(>4096) ,ASCII format
return	None		
remark			
demo			

11.45 MfSdkEmvCallbackEventSetAmtBeforeGpo

Prototype	<code>void MfSdkEmvCallbackEventSetAmtBeforeGpo(void);</code>		
Function	set amount before gpo		
Params	in	None	
	out	None	
return	None		

remark	
demo	

11.46 MfSdkEmvCallbackEventGetAmtBeforeGpo

Prototype	s32 MfSdkEmvCallbackEventGetAmtBeforeGpo(void);	
Function	get amount before gpo	
Params	in	None
	out	None
return		0x00
		0x01
remark		
demo		

11.47 MfSdkEmvCallbackEventClear

Prototype	void MfSdkEmvCallbackEventClear(void);	
Function	clear emv callback event	
Params	in	None
	out	None
return		None
remark		
demo		

11.48 MfSdkEmvCallbackEventClear

Prototype	char* MfSdkEmvGetEmvL2Version(void);
Function	Get EMV(contact) kernel L2 cert version

Params	in	None
	out	None
return		!=NULL EMV(contact) kernel L2 cert version
remark		
demo		

11.49 MfSdkEmvGetEmvL2KernelName

Prototype	char* MfSdkEmvGetEmvL2Version(void);	
Function	Get EMV(contact) kernel L2 cert kernel name	
Params	in	None
	out	None
return		!=NULL EMV(contact) kernel L2 cert version
remark		
demo		

11.50 MfSdkEmvGetAidsInit

Prototype	void *MfSdkEmvGetAidsInit(void);	
Function	aid params init ref. MfSdkEmvGetAidsFree	
Params	in	None
	out	None
return		!=NULL aids pointer
remark		
demo		

11.51 MfSdkEmvGetAid

Prototype	s32 MfSdkEmvGetAid(void *pTerminalApps, s32 index , u8 *outAidsTlv,s32 outAidsTlvLength);
------------------	---

Function		Get Aid tlv		
Params	in	pTerminalApps	aids pointer	
		index	aid index index must less than MfSdkEmvGetAidNum()	
		outAidsTlvLength	outAidsTlv size min value 1024	
	out	None	aid tlv length	
	return	> =0	aids pointer	
		other	ref. MfSdkRet_E	
remark				
demo				

11.52 MfSdkEmvGetAidsFree

Prototype		void MfSdkEmvGetAidsFree(void *pTerminalApps);	
Function		free aids param pointer	
Params	in	pTerminalApps	aids pointer
	out	None	
return		None	
remark			
demo			

11.53 MfSdkEmvSetTlv2Kernel

Prototype		s32 MfSdkEmvSetTlv2Kernel(u8* pBerTlvData , s32 length);	
Function		set Kernel emv tlv	
Params	in	pBerTlvData	tlv data
		length	tlv data length
	out	None	
return		None	
remark			

demo	
------	--

12 System module

12.1 Module description

This module mainly includes system APIs.

12.2 Module structure declaration

```
typedef struct
{
    int nYear;
    int nMonth;
    int nDay;
    int nHour;
    int nMinute;
    int nSecond;
}MfSdkSysTime_T;

typedef struct
{
    int capacity;
    int voltage_level;
    int status;
}MfSdkBatterAttr_T;

typedef struct{
    u32 total_size;    ///< memory heap total size
    u32 avail_size;   ///< available size. The actual allocatable size may be
less than this
    u32 max_block_size; ///< maximum allocatable block size
}MfSdkSysHeap_T;

typedef TERMINALINFO MfSdkSysTermInfo_T;
```

12.3 Constant declarations

```
#define MFSDK_SYS_DEVICE_MF960      CPU_EC8521
///<mf960
#define MFSDK_SYS_DEVICE_H9N          CPU_EC25           ///<h9n
```

```
#define MFSDK_SYS_DEVICE_H9L      CPU_V133      ///<h9l
#define MFSDK_SYS_DEVICE_H9PRO     CPU_X2600_H9Pro
///<h9pro
#define MFSDK_SYS_DEVICE_960B     CPU_X2600_MF960
///<960b

typedef enum
{
    MFSDK_SYS_RET_FAILED = -3, //failed
    MFSDK_SYS_RET_BOUNDS = -2, //Array out-of-bounds
    MFSDK_SYS_RET_PARM_ERROR = -1, //check param
    MFSDK_SYS_RET_OK = 0,
}MfSdkSysRet_E;

typedef enum
{
    MFSDK_SYS_LCD_TYPE_GET_FILE = -1,           ///<get file
    MFSDK_SYS_LCD_TYPE_480_800 = 0,               ///<mf960
    MFSDK_SYS_LCD_TYPE_320_240,                  ///<h9u/h9l/h9n
    MFSDK_SYS_LCD_TYPE_240_240 = 11,
    MFSDK_SYS_LCD_TYPE_320_480,
    MFSDK_SYS_LCD_TYPE_128_32,
}MfSdkSysLcdType_E;

typedef enum
{
    MFSDK_SYS_POWER_SHUTDOWN,
    MFSDK_SYS_POWER_LOW,
    MFSDK_SYS_POWER_CHARGE,
    MFSDK_SYS_POWER_OUT,
    MFSDK_SYS_NET_CONFIG_MODE,
    MFSDK_SYS_NET_GPRS_MODE,
    MFSDK_SYS_NET_WIFI_MODE,
    MFSDK_SYS_WIFI_AIRKISS_CONFIG,
    MFSDK_SYS_WIFI_AP_CONFIG,
    MFSDK_SYS_WIFI_CONFIG_SUCCESS,
    MFSDK_SYS_WIFI_CONFIG_FAIL,
    MFSDK_SYS_TMS_UPDATE_START,//Tms Update Start
    MFSDK_SYS_TMS_UPDATE_UNZIP,//Tms Update Unzip
    MFSDK_SYS_TMS_UPDATE_SUCC,//Tms Update Succ
    MFSDK_SYS_TMS_UPDATE_FAIL,//Tms Update Fail
    MFSDK_SYS_TMS_SIGN_SUCC,//Tms Sign Succ
```

```
    MFSDK_SYS_TMS_SIGN_FAIL,//Tms Sign Fail
    MFSDK_SYS_TMS_DOWN_FINISH_SUCC,//Tms Down Finish Succ
    MFSDK_SYS_TMS_DOWN_FINISH_FAIL,//Tms Down Finish Fail
    MFSDK_SYS_TMS_DOWN_FINISH_PAUSE,//Tms Down Finish

Pause
    MFSDK_SYS_TMS_DOWN_FINISH_CONTINUE,//Tms Finish

Continue
    MFSDK_SYS_TMS_DOWN_FINISH_STOP,//Tms FinishStop
    MFSDK_SYS_LOW_BATTERY_SHUTDOWN,//Low Battery Shutdown
    MFSDK_SYS_RTC_TIME_SET,//RTC SET TIME
    MFSDK_SYS_POWER_FULL,//Battery full
}MfSdkSysState_E;
```

```
typedef enum
{
    MFSDK_SYS_DEV_MODEL_UNKNOWN = -1,
    MFSDK_SYS_DEV_MODEL_M60A = 0,
    MFSDK_SYS_DEV_MODEL_M60B,
    MFSDK_SYS_DEV_MODEL_M90L,
    MFSDK_SYS_DEV_MODEL_M60C,
    MFSDK_SYS_DEV_MODEL_MP60,
    MFSDK_SYS_DEV_MODEL_70N,
    MFSDK_SYS_DEV_MODEL_70N2,
    MFSDK_SYS_DEV_MODEL_M90,
    MFSDK_SYS_DEV_MODEL_H9,
    MFSDK_SYS_DEV_MODEL_H9A,
    MFSDK_SYS_DEV_MODEL_H9L,
    MFSDK_SYS_DEV_MODEL_H9N,
    MFSDK_SYS_DEV_MODEL_H9U,
    MFSDK_SYS_DEV_MODEL_H9PRO,
    MFSDK_SYS_DEV_MODEL_ET389,
    MFSDK_SYS_DEV_MODEL_ET389PRO,
    MFSDK_SYS_DEV_MODEL_MF919,
    MFSDK_SYS_DEV_MODEL_MF960,
    MFSDK_SYS_DEV_MODEL_MF960B,
    MFSDK_SYS_DEV_MODEL_70N3,
    MFSDK_SYS_DEV_MODEL_SR600MINI,
    MFSDK_SYS_DEV_MODEL_MP70A30,
    MFSDK_SYS_DEV_MODEL_MP70N5,
    MFSDK_SYS_DEV_MODEL_MP70A20,
    MFSDK_SYS_DEV_MODEL_MP70MIS,
    MFSDK_SYS_DEV_MODEL_MP70A5,
```

```

        MFSDK_SYS_DEV_MODEL_H9PROA30,
        MFSDK_SYS_DEV_MODEL_MP70A6,
        MFSDK_SYS_DEV_MODEL_Z990,
    }MfSdkSysDevType_E;

typedef enum
{
    MFSDK_SYS_CONSOLE_AP = 1, // Display all port
    MFSDK_SYS_CONSOLE_CDC = 2, // Only display NMEA port
    MFSDK_SYS_CONSOLE_CDC_ACM = 3, // acm ap cp port
}MfSdkSysConsole_E;
typedef TERMINALINFO MfSdkSysTermInfo_T;

typedef void* MfSdkSysThreadMutex;

typedef int (*MfSdkSysPlayCallback)( int type, void *data);
typedef void (*MfSdkSysAppStartCallback)(void);

```

12.4 MfSdkSysGetDevModel

Prototype	LIB_EXPORT s32 MfSdkSysGetDevModel(void)		
Function	Obtain the terminal model.		
Params	in	None	
	out	None	
return	Dev Model		Ref. MfSdkSysDevType_E
remark			
demo			

12.5 MfSdkSysGetDevModelName

Prototype	LIB_EXPORT char* MfSdkSysGetDevModelName(void)		
Function	Obtain the terminal name.		
Params	in	None	
	out	None	

return	device model name
remark	
demo	ET389Pro: char *modelName = MfSdkSysGetDevModelName(); APP_TRACE("modelName:%s\r\n",modelName); Result: modelName:ET389Pro

12.6 MfSdkSysDevs

Prototype	LIB_EXPORT MFSDKBOOL MfSdkSysDevs(s32 model)		
Function	Check whether the terminal is a model.		
Params	in	model	Ref. MfSdkSysDevType_E
	out	None	
return	MFSDK_TRUE	yes	
	MFSDK_FALSE	no	
remark			
demo	APP_TRACE("MFSDK_SYS_DEV_MODEL_ET389 :%s\r\n",MfSdkSysDevs(MFSDK_SYS_DEV_MODEL_ET389));		

12.7 MfSdkSysGetHardwareVer

Prototype	LIB_EXPORT s32 MfSdkSysGetHardwareVer(void)		
Function	Get hardware version.		
Params	in	None	
	out	None	
return	hardware version 300/400/500		
remark			
demo			

12.8 MfSdkSysGetTime

Prototype	LIB_EXPORT s32 MfSdkSysGetTime(MfSdkSysTime_T *pTime)				
Function	Get terminal date and time.				
Params	in	*pTime	MfSdkSysTime_T point.		
	out	None			
return	MFSYS_RET Success T_OK				
	MFSYS_RET fail T_PARM_ERROR				
remark					
demo	<pre>MfSdkSysTime_T stDateTime; memset(&stDateTime,0,sizeof(MfSdkSysTime_T)); if(MfSdkSysGetTime(&stDateTime) == MFSYS_RET_OK) { //TODO }</pre>				

12.9 MfSdkSysApplsLock

Prototype	LIB_EXPORT s32 MfSdkSysApplsLock()				
Function	Determine whether the app is locked. For example, when TMS is running, the application is locked.				
Params	in	None			
	out	None			
return	1	lock			
	0	unlock			
remark					
demo	<pre>if(MfSdkSysApplsLock() == 1) { //TODO }</pre>				

12.10 MfSdkSysAuxLcdGetBrightness

Prototype	LIB_EXPORT s32 MfSdkSysAuxLcdGetBrightness()				
Function	LCD get brightness				
Params	in	None			
	out	None			
return	light	The range is between 10 and 255			
remark					
demo					

12.11 MfSdkSysAuxLcdSetBrightness

Prototype	LIB_EXPORT void MfSdkSysAuxLcdSetBrightness(s32 light)		
Function	LCD set brightness		
Params	in	light	The range is between 10 and 255
	out	None	
return	Nothing		
remark			
demo			

12.12 MfSdkSysSubAuxLcdGetBrightness

Prototype	s32 MfSdkSysSubAuxLcdGetBrightness();		
Function	Sub LCD get brightness		
Params	in	None	
	out	None	
return	>=10	The range is between 10 and 255	
remark			

demo	
------	--

12.13 MfSdkSysSubAuxlcdSetBrightness

Prototype		void MfSdkSysAuxlcdSetBrightness(s32 light);	
Function		Sub LCD set brightness	
Params	in	light	light The range is between 10 and 255
	out	None	
return		Nothing	
remark			
demo			

12.14 MfSdkSysBatterCharge

Prototype		LIB_EXPORT s32 MfSdkSysBatterCharge(void)	
Function		Charging state	
Params	in	None	
	out	None	
return		MFSDK_SYS_RET _charging OK Other not charging	
remark			
demo			

12.15 MfSdkSysGetBatterStatus

Prototype		LIB_EXPORT s32 MfSdkSysGetBatterStatus(MfSdkBatterAttr_T* batterystatus)	
Function		Battery state	
Params	in	None	

	out	batterystatus	battery status
return	1	charging	
	0	not charging	
	-1	fail	
remark			
demo			

12.16 MfSdkSysBuzzerSound

Prototype	LIB_EXPORT void MfSdkSysBuzzerSound(s32 nMillisecond)				
Function	Buzzer				
Params	in	nMillisecond	time		
	out	None			
return	Nothing				
remark					
demo					

12.17 MfSdkSysCheckKey

Prototype	LIB_EXPORT s32 MfSdkSysCheckKey(void)				
Function	Scan button, non blocking				
Params	in	None			
	out	None			
return	KEY_VALUE	key pressed			
	0	No key			
	-1	Fail			
remark					
demo					

12.18 MfSdkSysCheckTick

Prototype	LIB_EXPORT s32 MfSdkSysCheckTick(s32 tick, s32 timeover)	
Function	Check for timeout	
Params	in	tick Starting time
		timeover Timeout period
	out	None
return	1	timeout
	0	within the effective time
remark		
demo		

12.19 MfSdkSysClrKey

Prototype	LIB_EXPORT void MfSdkSysClrKey(void)	
Function	Not implemented	
Params	in	None
	out	None
return	Nothing	
remark		
demo		

12.20 MfSdkSysConfig

Prototype	LIB_EXPORT void MfSdkSysConfig(void)	
Function	The manufacturer sets the individual parameter settings and invokes the individual settings function of each manufacturer.	
Params	in	None
	out	None

return	Nothing
remark	
demo	

12.21 MfSdkSysCurlInit

Prototype	LIB_EXPORT s32 MfSdkSysCurlInit(s32 Argc, s8** Argv, s8* AppName)	
Function	Initialization of system and initialization of application layer	
Params	in	Argc Reusing main function parameter Argc
		Argv Reusing main function parameter Argv
		AppName Application name
return	out	None
	return	1 For the first time since the program was updated
		2 Program is not run for the first time
remark		Other Fail
		Not to be processed without access. Inside the function calls the private API of the manufacturer. The API returns to the first operation only when the program is newly installed, and the update is not the first operation.
demo		

12.22 MfSdkSysDelay

Prototype	LIB_EXPORT void MfSdkSysDelay(u32 uiMs)	
Function	Delay blocking	
Params	in	uiMs Delay time unit MS
	out	None
return	Nothing	
remark		
demo		

12.23 MfSdkSysEnergySetTime

Prototype	LIB_EXPORT s32 MfSdkSysEnergySetTime(s32 nTime)		
Function	Energy-saving time		
Params	in	nTime	unit second
	out	None	
return	Nothing		
remark			
demo			

12.24 MfSdkSysEnergyTime

Prototype	LIB_EXPORT s32 MfSdkSysEnergyTime()		
Function	Get Energy-saving time		
Params	in	None	
	out	None	
return	Energy-saving time unit:second		
remark			
demo			

12.25 MfSdkSysEraseSecureArea

Prototype	LIB_EXPORT s32 MfSdkSysEraseSecureArea(u32 addr)		
Function	Erase safe area data, 4K at a time.		
Params	in	addr	0 / 4*1024
	out	None	
return	MFSYS_ERESTATUS_T_OK Success		

	Other	Fail
remark		
demo	int iRet = Sys_EraseSecureArea(0); iRet = Sys_EraseSecureArea(4*1024);	

12.26 MfSdkSysFileSetPath

Prototype	LIB_EXPORT void MfSdkSysFileSetPath(s32 mode)		
Function	Set the storage mode		
Params	in	mode	Storage location, Reference enum FILELOCATION
	out	None	
return	Nothing		
remark			
demo			

12.27 MfSdkSysGetBatterLevel

Prototype	LIB_EXPORT s32 MfSdkSysGetBatterLevel(void)				
Function	Get power supply				
Params	in	None			
	out	None			
return	0-5	Battery level			
	-1	Fail			
remark					
demo					

12.28 MfSdkSysGetDateTime

Prototype	LIB_EXPORT s32 MfSdkSysGetDateTime(u8* DateTime)		
------------------	---	--	--

Function	Get SysTime		
Params	in	None	
	out	DateTime	"YYYYMMDDHHMMSS" 14 bytes
return	MFSDK_SYS_RET - Success OK		
	Other	Fail	
remark			
demo			

12.29 MfSdkSysGetIsLcd

Prototype	LIB_EXPORT s32 MfSdkSysGetIsLcd(void)				
Function	Check whether 389 has a front display				
Params	in	None			
	out	None			
return	1	have front display			
	-1	have no front display			
remark					
demo					

12.30 MfSdkSysGetLcdType

Prototype	LIB_EXPORT s32 MfSdkSysGetLcdType()				
Function	Get the screen LCD type				
Params	in	None			
	out	None			
return	LCD type	Ref. MfSdkSysLcdType_E			
remark					
demo					

12.31 MfSdkSysGetPsn

Prototype		LIB_EXPORT void MfSdkSysGetPsn(s8* psn)
Function		
Params	in	None
	out	psn
return		Nothing
remark		
demo		

12.32 MfSdkSysGetTerminalInfo

Prototype		LIB_EXPORT s32 MfSdkSysGetTerminalInfo(MfSdkSysTermInfo_T* terminal)
Function		Get terminal information
Params	in	None
	out	terminal Reference TERMINALINFO
return		MFSDK_SYS_RET_ success OK Other fail
remark		
demo		

12.33 MfSdkSysGetTermSn

Prototype		LIB_EXPORT s32 MfSdkSysGetTermSn(s8* Sn)
Function		Get terminal SN
Params	in	None
	out	sn Reference TERMINALINFO

return	MFSDK_SYS_RET_	success
	OK	
remark	no safe please use API MfSdkSysGetTerminalSn	
demo		

12.34 MfSdkSysGetTerminalSn

Prototype	LIB_EXPORT const s8* MfSdkSysGetTerminalSn(s8*pData,s32 length)	
Function	Get terminal SN	
Params	in	length
	out	pData Reference TERMINALINFO
return	None	
remark		
demo		

12.35 MfSdkSysGetTick

Prototype	LIB_EXPORT u32 MfSdkSysGetTick()	
Function	Get the current time	
Params	in	None
	out	None
return	tick	Get time tick unit ms
remark		
demo		

12.36 MfSdkSysGetTickDiff

Prototype	LIB_EXPORT s32 MfSdkSysGetTickDiff(s32 tick1)
------------------	---

Function		Calculate time difference	
Params	in	tick1	start tick
	out	None	
return		tick	Time difference
remark			
demo			

12.37 MfSdkSysGetTimeStamp

Prototype		LIB_EXPORT time_t MfSdkSysGetTimeStamp()	
Function		get time stamp	
Params	in	tick1	start tick
	out	None	
return		time_t lt	time stamp
remark			
demo			

12.38 MfSdkSysGuiGroupGetObj

Prototype		LIB_EXPORT void* MfSdkSysGuiGroupGetObj()	
Function			
Params	in	None	
	out	None	
return		lvgl object	
remark			
demo			

12.39 MfSdkSysHttpDownload

Prototype		LIB_EXPORT s32 MfSdkSysHttpDownload(s32 sock_index, const s8* url, const s8* fullpathfilename)		
Function		http download file		
Params	in	sock_index	socket used by the device Ref. MfSdkCommSocketIndex_E	
		url	Download link	
		fullpathfilename	Save path	
	out	None		
	return	MFSDK_SYS_RET_ success		
		OK	fail	
remark				
demo				

12.40 MfSdkSysHttpDownloadUseAgent

Prototype		LIB_EXPORT void MfSdkSysHttpDownloadUseAgent(s32 useAgent)		
Function		Http download message configuration		
Params	in	useAgent	UseAgent Whether to use User-Agent for http download(0 - 1)	
		out	None	
return		Nothing		
remark				
demo				

12.41 MfSdkSysInit

Prototype		LIB_EXPORT s32 MfSdkSysInit(s32 Argc, s8** Argv, s8* AppName)	

Function		Initialization of system and initialization of application layer Nothing. (For Traditional POS)	
Params	in	Argc	Reusing main function parameter Argc
		Argv	Reusing main function parameter Argv
	out	AppName	Application name
return		None	
		<0	fail
		1	for the first time since the program was updated.
		2	Program is not run for the first time.
remark	Not to be processed without access.Inside the function calls the private API of the manufacturer.The API returns to the first operation only when the program is newly installed, and the update is not the first operation.		
demo			

12.42 MfSdkSysLcdCalibration

Prototype		LIB_EXPORT void MfSdkSysLcdCalibration()	
Function	Screen Calibration		
Params	in	None	
	out	None	
return	Nothing		
remark			
demo			

12.43 MfSdkSysLogoInit

Prototype		LIB_EXPORT s32 MfSdkSysLogoInit(s8* logoPath)	
Function	logo init		
Params	in	logoPath	Path of the logo.bin file
	out	None	

return	MFSDK_SYS_RET_	success
	OK	
remark		
demo		

12.44 MfSdkSysLogoInitA

Prototype	s32 MfSdkSysLogoInitA(s8* logoPath, MFSDKBOOL bDelete);	
Function	logo init	
Params	in	logoPath logo file Path
	in	bDelete Whether to delete logo file MFSDK_TRUE-yes, MFSDK_FALSE-no
	out	None
return	MFSDK_SYS_RET_	success
	OK	
remark		
demo		

12.45 MfSdkSysModelType

Prototype	LIB_EXPORT s32 MfSdkSysModelType()	
Function		
Params	in	None
	out	None
return	0	wireless
	1	MODEM
remark		
demo		

12.46 MfSdkSysNetSetDatacallType

Prototype	LIB_EXPORT void MfSdkSysNetSetDatacallType()	
Function	Set other network injection processes	
Params	in	None
	out	None
return	Nothing	
remark	Called before Sys_Start.Resolved the jiociot sim card network injection failure	
demo		

12.47 MfSdkSysPrintAdd

Prototype	LIB_EXPORT void MfSdkSysPrintAdd(const s8* pbuff)	
Function	print buff add	
Params	in	pbuff print buff
	out	None
return	Nothing	
remark		
demo		

12.48 MfSdkSysReadFlashData

Prototype	LIB_EXPORT void MfSdkSysReadFlashData(s8* pdata, s32 size)	
Function	Read flash data	
Params	in	size data size
	out	pdata read Data content
return	Nothing	

remark	
demo	

12.49 MfSdkSysReadSecureArea

Prototype	LIB_EXPORT s32 MfSdkSysReadSecureArea(u32 addr, u8* pData, s32 iDataLength)	
Function	Read secure area data.	
Params	in	addr Read data start offset 0-8191
		iDataLength
	out	pData
return	>=0	read data length
	< 0	fail
remark		
demo	<pre>s32 iRet = 0; u8 mBuffer[1024] = {0}; iRet = Sys_ReadSecureArea(0, mBuffer, sizeof(mBuffer));</pre>	

12.50 MfSdkSysReboot

Prototype	LIB_EXPORT s32 MfSdkSysReboot(void)	
Function	Terminal reboot	
Params	in	None
	out	None
return	MFSDK_SYS_RET_ success OK -1 fail	
remark		
demo		

12.51 MfSdkSysRfidEmulateConfig

Prototype		LIB_EXPORT s32 MfSdkSysRfidEmulateConfig(u8* cardinfo, s32 infolen, u8(*cardblock)[4], u32 block_cap)		
Function		ntag analog card config		
Params	in	cardinfo	Pointer to memory card information	
		infolen	The length of card information	
		cardblock	A two-dimensional array pointer for storing card block data	
		block_cap	The number of blocks that the card can support	
return	out	None		
	return	MFSDK_SYS_RET_	success	
		OK		
other		fail		
remark				
demo				

12.52 MfSdkSysRfidEmulateDeinit

Prototype		LIB_EXPORT s32 MfSdkSysRfidEmulateDeinit(void)	
Function		ntag deinitialization of analog cards	
Params	in	None	
	out	None	
return	return	MFSDK_SYS_RET_	success
		OK	
	Other	fail	
remark			
demo			

12.53 MfSdkSysRfidEmulateInit

Prototype		LIB_EXPORT s32 MfSdkSysRfidEmulateInit(void)	
Function		ntag analog card initialization	
Params	in	None	
	out	None	
return		MFSDK_SYS_RET_	success
		OK	
remark	Other		fail
demo			

12.54 MfSdkSysRfidEmulateProcess

Prototype		LIB_EXPORT void MfSdkSysRfidEmulateProcess(void)	
Function		ntag analog card execution processing	
Params	in	None	
	out	None	
return		Nothing	
remark			
demo			

12.55 MfSdkSysRun

Prototype		LIB_EXPORT s32 MfSdkSysRun()	
Function		system running	
Params	in	None	
	out	None	

return	Nothing
remark	
demo	

12.56 MfSdkSysSetDateTime

Prototype		LIB_EXPORT s32 MfSdkSysSetDateTime(u8* DateTime)	
Function		Set SysTime	
Params	in	DateTime	"YYYYMMDDHHMMSS" 14 bytes
	out	None	
return	-2	Parameter Error	
	-1	Fail	
	0	Success	
remark	Internal judgment of time format in API		
demo			

12.57 MfSdkSysSetLanguage

Prototype		LIB_EXPORT void MfSdkSysSetLanguage(s32 nLanguageType)	
Function		Set device language, must set the right font priority	
Params	in	nLanguageType	0 - Chinese, 1 - English, 2 - Persian
	out	None	
return		Nothing	
remark			
demo			

12.58 MfSdkSysSetLogData

Prototype	LIB_EXPORT void MfSdkSysSetLogData(s8* buff, s32 len)		
Function	Log set		
Params	in	buff	
		len	
	out	None	
return	Nothing		
remark			
demo			

12.59 MfSdkSysSetScrBackLight

Prototype	LIB_EXPORT s32 MfSdkSysSetScrBackLight(byte mode)		
Function	Set screen backlight mode		
Params	in	mode	Backlight mode: 0 - turn off backlight, 1 - system automatically controls, 2 - backlight is always bright.
		None	
	return	MFSDK_SYS_RET_	success OK Other fail
remark	Mode=1 indicates that the backlight is automatically controlled by the system, with a default of 1.		
demo			

12.60 MfSdkSysSleep

Prototype	LIB_EXPORT s32 MfSdkSysSleep(u32 Time)		
------------------	--	--	--

Function	This API is a delay feature.				
Params	in	Time	Entering dormancy time, unit milliseconds		
	out	None			
return	MFSDK_SYS_RET _success OK				
	Other	fail			
remark					
demo					

12.61 MfSdkSysStart

Prototype	LIB_EXPORT void MfSdkSysStart(const s8* app_ver, MfSdkSysAppStartCallback apprun)		
Function	Check for timeout		
Params	in	app_ver	Application version
		apprun	Application task
return	None		
	Nothing		
remark			
demo			

12.62 MfSdkSysTaskAppSet

Prototype	LIB_EXPORT void MfSdkSysTaskAppSet(void* pfunc)		
Function	Open Task		
Params	in	pfunc	Processing function of task
		None	
return	Nothing		
	None		
remark			
demo			

12.63 MfSdkSysTaskCreate

Prototype		LIB_EXPORT s32 MfSdkSysTaskCreate(void (*pfun)(void* param), s32 prio, void* param, s32 task_size)			
Function		Create system task			
Params	in	pfun	Processing function of task		
		prio	Task priority		
	param	param	Task param		
	task_size	task_size	Stack size		
out		None			
return		MFSDK_SYS_RET_	success		
OK					
other		fail			
remark					
demo					

12.64 MfSdkSysTimerCheck

Prototype		LIB_EXPORT s32 MfSdkSysTimerCheck(s32 iHandle)			
Function		Check whether the timing time is up to			
Params	in	iHandle	Timer		
	out	None			
return		>=0	success, Remaining time, unit milliseconds (0 indicates timed time)		
Other		fail			
remark					
demo					

12.65 MfSdkSysTimerClose

Prototype	LIB_EXPORT s32 MfSdkSysTimerClose(s32 iHandle)
------------------	--

Function		Off Timer	
Params	in	iHandle	Timer
	out	None	
return		MFSDK_SYS_RET_ success	
		OK	
remark		Other	fail
demo			

12.66 MfSdkSysTimerCreate

Prototype		LIB_EXPORT u32 MfSdkSysTimerCreate(void* pfunc, void* pParam, u32 nPeriod, u32 nMode, u32* pnErrorCode)		
Function		Create a timer		
Params	in	pfunc	callback func	
		pParam	params	
		nPeriod	period	
		nMode	mode	
		pnErrorCode	error code	
out		None		
		>0	success, timer handle	
return		0	fail	
remark				
demo				

12.67 MfSdkSysTimerEnable

Prototype		LIB_EXPORT u32 MfSdkSysTimerEnable(u32 nTimerNo)	
Function		Enable timer	
Params	in	nTimerNo	timer handle
	out	None	
return		MFSDK_SYS_RET_success	

	OK	
	Other	fail
remark		
demo		

12.68 MfSdkSysTimerDelete

Prototype	u32 MfSdkSysTimerDelete(u32 nTimerNo)		
Function	Delete timer		
Params	in	nTimerNo	timer handle
	out	None	
return	MFSDK_SYS_RET_		success
	OK		
		Other	fail
remark			
demo			

12.69 MfSdkSysTimerOpen

Prototype	LIB_EXPORT u32 MfSdkSysTimerOpen(u32 TimerMs)		
Function	Open timer and set timer time		
Params	in	TimerMs	Timer time
	out	None	
return	>=0		success,return timer handle
	Other		fail
remark			
demo			

12.70 MfSdkSysTtsSystemSetFunc

Prototype	LIB_EXPORT void MfSdkSysTtsSystemSetFunc(MfSdkSysPlayCallback playproc)	
Function	system tts callback eg. batter low, wifi mode etc.	
Params	in	playproc
	out	None
return	Nothing	
remark		
demo		

12.71 MfSdkSysUnzipFileFunc

Prototype	LIB_EXPORT s32 MfSdkSysUnzipFileFunc(s8* szFileName, s8* folder, MFSDKBOOL del)	
Function	Unzip packet	
Params	in	szFileName Path of the compressed package
		folder Unzip to the specified folder
	out	del MFSDK_TRUE:Delete the zip package after the decompression is complete; MFSDK_FALSE:The zip package is not deleted after the decompression is successful
		None
return	MFSDK_SYS_RET_ success	
	OK	
remark		
	MfSdkSysUnzipFileFunc("exdata\\images.zip","exdata",MFSDK_TRUE);	
demo		

12.72 MfSdkSysVersion

Prototype	LIB_EXPORT s32 MfSdkSysVersion()
------------------	---

Function	get system version and trace out to log tool	
Params	in	None
	out	None
return	system version	
remark		
demo		

12.73 MfSdkSysWriteFlashData

Prototype	LIB_EXPORT void MfSdkSysWriteFlashData(s8* pdata, s32 size)	
Function		
Params	in	pdata write data stream size write data stream length
	out	None
return	Nothing	
remark		
demo		

12.74 MfSdkSysWriteSecureArea

Prototype	LIB_EXPORT s32 MfSdkSysWriteSecureArea(u32 addr, u8* pData, s32 iDataLength)	
Function		
Params	in	addr 0~8191 pData write data stream iDataLength write data stream length
	out	None
return	MFSDK_SYS_RET_ success OK Other fail	
remark		

demo	iRet = Sys_WriteSecureArea(0, (u8*)"12345678", 8);
------	--

12.75 MfSdkSysZipUpdate

Prototype		LIB_EXPORT void MfSdkSysZipUpdate()
Function		TMS update(Unpack zip file and upgrade, then reboot)
Params	in	None
	out	None
return		Nothing
remark		
demo		

12.76 MfSdkSysDriverLibInit

Prototype		LIB_EXPORT void MfSdkSysDriverLibInit()
Function		Initialization driver
Params	in	None
	out	None
return		Nothing
remark		
demo		

12.77 MfSdkSysTaskApplInit

Prototype		LIB_EXPORT s32 MfSdkSysTaskApplInit(void)
Function		if SoundBox support NFC should init
Params	in	None
	out	None
return		MFSDK_SYS_RET_success

	OK	
	Other	fail
remark		
demo		

12.78 MfSdkSysPubDriverInit

Prototype	LIB_EXPORT s32 MfSdkSysPubDriverInit(void)		
Function	Init Driver		
Params	in	None	
	out	None	
return	MFSDK_SYS_RET_ success OK		
	Other	fail	
remark			
demo			

12.79 MfSdkSysFontInit

Prototype	LIB_EXPORT s32 MfSdkSysFontInit(void)		
Function	Init font library		
Params	in	None	
	out	None	
return	MFSDK_SYS_RET_ success OK		
	Other	fail	
remark			
demo			

12.80 MfSdkSysConsoleSwitch

Prototype	void MfSdkSysConsoleSwitch(MfSdkSysConsole_E switchE);		
Function	set device port		
Params	in	switchE	refer to MfSdkSysConsole_E
	out	None	
return	None		
remark			
demo			

12.81 MfSdkSysThreadMutexInit

Prototype	s32 MfSdkSysThreadMutexInit(MfSdkSysThreadMutex *mutex);		
Function	init mutex		
Params	in	None	
	out	mutex	MfSdkSysThreadMutex handle
return	ref. MfSdkSysRet_E		
remark			
demo			

12.82 MfSdkSysThreadMutexLock

Prototype	s32 MfSdkSysThreadMutexLock(MfSdkSysThreadMutex *mutex ,void* param);		
Function	mutex lock		
Params	in	mutex	MfSdkSysThreadMutex handle
		param	NULL
	out	None	
return	ref. MfSdkSysRet_E		

remark	
demo	

12.83 MfSdkSysThreadMutexUnlock

Prototype	<code>s32 MfSdkSysThreadMutexUnlock(MfSdkSysThreadMutex *mutex);</code>		
Function	mutex unlock		
Params	in	mutex	MfSdkSysThreadMutex handle
	out	None	
return	ref. MfSdkSysRet_E		
remark			
demo			

12.84 MfSdkSysThreadMutexDestroy

Prototype	<code>s32 MfSdkSysThreadMutexDestroy(MfSdkSysThreadMutex *mutex);</code>		
Function	Destroy mutex		
Params	in	mutex	MfSdkSysThreadMutex handle
	out	None	
return	ref. MfSdkSysRet_E		
remark			
demo			

12.85 MfSdkSysGetSegmentLcdDisplayMaxLength

Prototype	<code>s32 MfSdkSysGetSegmentLcdDisplayMaxLength(void);</code>		
Function	Get segment lcd max length of display 6/7/9		
Params	in	mutex	MfSdkSysThreadMutex handle

	out	None
return	>0	Get segment lcd max length of display 6/7/9
	other	failed
remark		
demo		

12.86 MfSdkSysIsExternalFlash

Prototype	<code>s32 MfSdkSysGetSegmentLcdDisplayMaxLength(void);</code>	
Function	Check whether there is an external flash.	
Params	in	None
	out	None
return	MFSRK_FALSE	not external Flash
	MFSRK_TRUE	external flash
remark		
demo		

12.87 MfSdkSysSetForceSleepTime

Prototype	<code>s32 MfSdkSysSetForceSleepTime(s32 timeS);</code>	
Function	Set the time for the device to enter the forced sleep mode after the screen is broken	
Params	in	timeS time. unit seconds
	out	None
return	ref. MfSdkSysRet_E	
remark		
demo		

12.88 MfSdkSysSetSleepToPoweroff

Prototype	<code>s32 MfSdkSysSetSleepToPoweroff(s32 timeS);</code>
------------------	---

Function	Set the shutdown time after the device enters sleep mode		
Params	in	timeS	time. unit seconds
	out	None	
return	ref. MfSdkSysRet_E		
remark			
demo			

12.89 MfSdkSysGetHeapInformation

Prototype	void MfSdkSysGetHeapInformation(MfSdkSysHeap_T *pHeapInfor);		
Function	get heap info		
Params	in	None	
	out	pHeapInfor	heap info
return	None		
remark			
demo			

12.90 MfSdkSysSetRestartEnabledOnce

Prototype	s32 MfSdkSysSetRestartEnabledOnce();		
Function	not restart the app after it crashes, use crash=reenter		
Params	in	None	
	out	None	
return	ref. MfSdkSysRet_E		
remark			
demo			

13 File System module

13.1 Module description

This module mainly includes File system APIs.

13.2 Module structure declaration

```
typedef struct
{
    s32 d_ino;           ///< inode number, file system
implementation can use it for any purpose
    u8 d_type;          ///< 8-file,other-dir type of file
    char d_name[256];   ///< file name
}MfSdkDirent_T;
```

13.3 Constant declarations

```
typedef enum
{
    MFSDK_FS_RET_CREATE_FAIL = -20, //create error
    MFSDK_FS_RET_OPEN_FAIL = -19, //open error
    MFSDK_FS_RET_READ_FAIL = -18, //read error,
    MFSDK_FS_RET_WRITE_FAIL = -17, //write error,
    MFSDK_FS_RET_SEEK_FAIL = -18, //seek error,
    MFSDK_FS_RET_DELETE_FAIL = -16, //delete error,
    MFSDK_FS_RET_REMOVE_FAIL = -15, //remove error,
    MFSDK_FS_RET_NO_RECORD = -10, //Record not found
    MFSDK_FS_RET_CLOSE_FAIL = -8, //Close file error
    MFSDK_FS_RET_NOEXIST = -4, //no found file
    MFSDK_FS_RET_FAILED = -3, //failed
    MFSDK_FS_RET_BOUNDS = -2, //Array out-of-bounds
    MFSDK_FS_RET_PARM_ERROR = -1, //check param
    MFSDK_FS_RET_OK = 0,
}MfSdkFsRet_E;

#define MFSDK_FS_SEEK_SET (FILE_SEEK_SET) //< To the file
header
#define MFSDK_FS_SEEK_CUR (FILE_SEEK_CUR) //< To the
current location
#define MFSDK_FS_SEEK_END (FILE_SEEK_END) //< To the end
of the file
#define MFSDK_FS_RDONLY (FILE_RDONLY) //< Read-only,
there is no return error
```

```

#define MFSDK_FS_WRONLY    (FILE_WRONLY)  ///< Write only,
there is no return error
#define MFSDK_FS_RDWRR   (FILE_RDWR)    ///< Read and write,
there is no return error
#define MFSDK_FS_APPEND   (FILE_APPEND)  ///< Append,
create if it does not exist, pointer to the end of the file
when it exists
#define MFSDK_FS_CREAT    (FILE_CREAT)   ///< Create,
delete rebuild when it already exists

typedef enum
{
    MFSDK_FS_FLAG_WRITE, // read and write
    MFSDK_FS_FLAG_CREAT, // if file does not exist create
    it ,if file exist will be truncated to length 0.
    MFSDK_FS_FLAG_READ, // only read
}MfSdkFsFlag_E;
typedef enum
{
    MFSDK_FS_MODE_READ, // only read
    MFSDK_FS_MODE_WRITE, // read and write
}MfSdkFsMode_E;

```

13.4 MfSdkFsSetPath

Prototype	LIB_EXPORT s32 MfSdkFsSetPath(const s8 *pPath)	
Function	set file path	
Params	in	pPath file path
	out	None
return	MFSDK_FS_RET_O K success	
remark		
demo		
demo		

13.5 MfSdkFsCheckPath

Prototype	LIB_EXPORT s32 MfSdkFsCheckPath(const s8 *FileName)				
Function	check if file exist				
Params	in	FileName	file name		
	out	None			
return	MFSDK_FS_RET_OK The file exist				
	MFSDK_FS_RET_NO EXIST The file does not exist				
remark					
demo					

13.6 MfSdkFsClean

Prototype	LIB_EXPORT s32 MfSdkFsClean()				
Function	delete all files				
Params	in	None			
	out	None			
return	MFSDK_FS_RET_O K success				
remark					
demo					

13.7 MfSdkFsClose

Prototype	LIB_EXPORT s32 MfSdkFsClose(FILE_HANDLE handle)		
Function	check if file exist		
Params	in	handle	file handler

	out	None
return	MFSDK_FS_RET_O	success
	K	
Other		fail,Ref.MfSdkFsRet_E
remark		
demo		

13.8 MfSdkFsDelete

Prototype	LIB_EXPORT s32 MfSdkFsDelete(FILE_HANDLE handle, u32 size)	
Function	File truncation	
Params	in	handle file handler
		size truncate size
	out	None
return	MFSDK_FS_RET_OK Success	
	Other Fail	
remark		
demo		

13.9 MfSdkFsGetFreeSpace

Prototype	LIB_EXPORT long MfSdkFsGetFreeSpace(const s8 *drive)	
Function	File system remaining space	
Params	in	drive default ""
	out	None
return	>0 success, the remaining space unit:KB	
	-1 fail	
remark		
demo	MfSdkFsGetFreeSpace("");	

13.10 MfSdkFsGetTotalSpace

Prototype	LIB_EXPORT long MfSdkFsGetTotalSpace(const s8 *drive)		
Function	File system total space		
Params	in	drive	default ""
	out	None	
return		>0	success, the remaining space unit:KB
		-1	fail
remark			
demo	MfSdkFsGetTotalSpace("");		

13.11 MfSdkFsGetModuleVer

Prototype	LIB_EXPORT s32 MfSdkFsGetModuleVer(char *pszVer)				
Function	Get File module version				
Params	in	None			
	out	pszVer			
return	MFSRK_FS_RET_O	success			
	K	fail			
remark					
demo					

13.12 MfSdkFsLseek

Prototype	LIB_EXPORT long MfSdkFsLseek(FILE_HANDLE handle, long offset, s32 origin)		
Function	Locating file pointer		
Params	in	handle	file handler

		offset
		origin start position
	out	None
return	>=0	success, offset position
	Other	fail
remark		
demo		

13.13 MfSdkFsMkdir

Prototype	LIB_EXPORT s32 MfSdkFsMkdir(s8* dirName)	
Function	Creating directories does not support recursive creation.	
Params	in	dirName
	out	None
return	MFSDK_FS_RET_O success K Other fail	
remark		
demo	<pre>if(MfSdkFsMkdir("edxata\testdir") == MFSDK_FS_RET_OK) { //create a folder of testdir }</pre>	

13.14 MfSdkFsOpen

Prototype	LIB_EXPORT s32 MfSdkFsOpen(const s8* name, s32 flag, s32 mode)	
Function	file open	
Params	in	name File Name End with NULL
		flag Open the file flag Ref.MfSdkFsFlag_E
		mode Open the file mode and refer to the MfSdkFsMode_E definition.
	out	None
return	>=0 success, file handler	

	Other	fail
remark		
demo	<pre>#include <stdio.h> #include <string.h> #include "libapi_xpos/inc/mfsdk_log.h" #include "libapi_xpos/inc/mfsdk_fs.h" #define FS_TRACE(...) MfSdkLogLevel("app", MFSDK_LOG_LEVEL_TRACE, __VA_ARGS__) #define FS_TRACE_BUFF(a, b) MfSdkLogHexBuff("app", MFSDK_LOG_LEVEL_TRACE, a, b); void TestFsCreateWriteRead(void) { s32 ret = MFSDK_RET_FAILED; ret = MfSdkFsCheckPath((const s8 *)TEST_FS_FILE); FS_TRACE("MfSdkFsCheckPath:%d\r\n", ret); if(ret == MFSDK_FS_RET_NOEXIST) { // create new file ret = MfSdkFsOpen((const s8 *)TEST_FS_FILE, MFSDK_FS_FLAG_CREAT, MFSDK_FS_MODE_WRITE); FS_TRACE("MfSdkFsOpen:%d\r\n", ret); if(ret >= 0) { MfSdkFsWrite(ret, "Hello World!", strlen("Hello World!")); MfSdkFsClose(ret); } } else { ret = MfSdkFsOpen((const s8 *)TEST_FS_FILE, MFSDK_FS_FLAG_WRITE, MFSDK_FS_MODE_WRITE); if(ret >= 0) { char buffer[1024] = {0}; s32 length = 0; length = MfSdkFsLseek(ret, 0, MFSDK_FS_SEEK_SET); FS_TRACE("MfSdkFsLseek:%d\r\n", length); length = MfSdkFsRead(ret, buffer, sizeof(buffer)); FS_TRACE("MfSdkFsRead:%d\r\n", length); if(length) { FS_TRACE("MfSdkFsRead buffer:%s\r\n", buffer); } length = MfSdkFsLseek(ret, 5, MFSDK_FS_SEEK_SET); } } }</pre>	

```
FS_TRACE("MfSdkFsLseek:%d\r\n", length);
memset(buffer, 0, sizeof(buffer));
length = MfSdkFsRead(ret, buffer, sizeof(buffer));
FS_TRACE("MfSdkFsRead:%d\r\n", length);

if(length) { FS_TRACE("MfSdkFsRead buffer:%s\r\n", buffer); }
length = MfSdkFsLseek(ret, 0, FILE_SEEK_CUR);
FS_TRACE("FILE_SEEK_CUR MfSdkFsLseek:%d\r\n", length);
memset(buffer, 0, sizeof(buffer));
length = MfSdkFsRead(ret, buffer, sizeof(buffer));
FS_TRACE("MfSdkFsRead:%d\r\n", length);

if(length) { FS_TRACE("MfSdkFsRead buffer:%s\r\n", buffer); }
length = MfSdkFsLseek(ret, 0, FILE_SEEK_END);
FS_TRACE("FILE_SEEK_END MfSdkFsLseek:%d\r\n", length);
memset(buffer, 0, sizeof(buffer));
length = MfSdkFsRead(ret, buffer, sizeof(buffer));
FS_TRACE("MfSdkFsRead:%d\r\n", length);

if(length) { FS_TRACE("MfSdkFsRead FILE_SEEK_CUR
buffer:%s\r\n", buffer); }
MfSdkFsClose(ret);
}

}
```

13.15 MfSdkFsPathClean

Prototype	LIB_EXPORT s32 MfSdkFsPathClean(s8* path)		
Function			
Params	in	path	
	out	None	
return	MFSDK_FS_RET_O		success
	K		fail
remark			
demo			

13.16 MfSdkFsRead

Prototype	LIB_EXPORT s32 MfSdkFsRead(FILE_HANDLE handle, char *buffer, s32 size)		
Function	file read		
Params	in	handle	file handler
		size	read size
	out	buffer	read buffer
return	>0 success, the number of bytes actually read		
	Other fail		
remark			
demo			

13.17 MfSdkFsReadLine

Prototype	LIB_EXPORT s32 MfSdkFsReadLine(FILE_HANDLE pFile, s8 *pLineBuff,u32 LineBuffSize)		
Function	Read a line of text and support.		
Params	in	pFile	file handler
		size	Line Buff Size
	out	pLineBuff	Text data read
return	MFSDK_FS_RET_O success		
	K		
	Other fail		
remark	For text files, read one row of data from the current location and jump to the next line.		
demo			

13.18 MfSdkFsReadProfileInt

Prototype	LIB_EXPORT s32 MfSdkFsReadProfileInt(const s8* section, const s8* key, s32 default_value, const s8* file)		
------------------	--	--	--

Function		Read int value in initialization file.
Params	in	section name of the section containing the key name
		key name of the key pairs to value
		default_value default value of result
		file path of the initialization file
	out	None
return		profile int value,if read fail, return default value
remark		
demo		

13.19 MfSdkFsReadProfileString

Prototype		LIB_EXPORT s32 MfSdkFsReadProfileString(const s8* section, const s8* key, s8* value, s32 size, const s8* default_value, const s8* file)
Function		Read string in initialization file.
Params	in	section name of the section containing the key name
		key name of the key pairs to value
		size size of result's buffer
		default_value default value of result
	out	file path of the initialization file
		value pointer to the buffer that receives the retrieved string
return		1 read success
		0 read fail
remark		
demo		

13.20 MfSdkFsUnlink

Prototype		LIB_EXPORT s32 MfSdkFsUnlink(const s8 * filename)
Function		Delete file

Params	in	filename	delete file name
	out	None	
return	MFSDK_FS_RET_O		success
	K		
Other		fail,Ref. MfSdkFsRet_E	
remark			
demo			

13.21 MfSdkFsWrite

Prototype	LIB_EXPORT s32 MfSdkFsWrite(FILE_HANDLE handle, char *buffer, s32 size)				
Function	File writing				
Params	in	handle	File handle to be written		
		buffer	Data to be written		
	size	data size to be written			
return	None				
	>0		Success.The number of bytes actually written.		
Other		fail,Ref. MfSdkFsRet_E			
remark					
demo					

13.22 MfSdkFsWriteSync

Prototype	s32 MfSdkFsWriteSync(FILE_HANDLE handle, char *buffer, s32 size, MFSDKBOOL bSync);		
Function	This includes writing through or flushing a disk cache if present		
Params	in	handle	File handle to be written
		buffer	Data to be written
	size	data size to be written	
return	None		
	>0		Success.The number of bytes actually written.

	Other	fail,Ref. MfSdkFsRet_E
remark		
demo		

13.23 MfSdkFsWriteBlockByName

Prototype		LIB_EXPORT s32 MfSdkFsWriteBlockByName(s8 * file_name, s32 write_start, s8 * write_buff, s32 write_size)	
Function		write one block data	
Params	in	file_name File handle to be written	
		write_start Data to be written	
		write_buff data size to be written	
		write_size write data count	
out		None	
		>0 Success. The number of bytes actually written.	
return		Other fail,Ref. MfSdkFsRet_E	
remark			
demo			

13.24 MfSdkFsWriteProfileInt

Prototype		LIB_EXPORT s32 MfSdkFsWriteProfileInt(const s8* section, const s8* key, s32 value, const s8* file)	
Function		write a profile int to a ini file	
Params	in	section name of the section, can't be NULL and empty string	
		key name of the key pairs to value, can't be NULL and empty string	
		value profile int value	
		file file path of ini file	
out		None	
		1 Success	
return		0 fail	

remark	
demo	

13.25 MfSdkFsWriteProfileString

Prototype		LIB_EXPORT s32 MfSdkFsWriteProfileString(const s8* section, const s8* key, const s8* value, const s8* file)		
Function		write a profile string to a ini file		
Params	in	section	name of the section,can't be NULL and empty string	
		key	name of the key pairs to value, can't be NULL and empty string	
		value	profile string value	
		file	file path of ini file	
out		None		
return		1	Success	
		0	fail	
remark				
demo				

13.26 MfSdkFsRenamePath

Prototype		LIB_EXPORT s32 MfSdkFsRenamePath(const char *oldName, const char *newName)	
Function		renames a file, moving it between directories if required	
Params	in	oldName	
		newName	
	out	None	
return		MFSDK_FS_RET_O K	Success
		MFSDK_FS_RET_P ARM_ERROR	Input params NULL
		Other	Failed
remark			

demo	MfSdkFsRenamePath("testdir3\\test.txt", "testdir4\\test.txt");
------	--

13.27 MfSdkFsClearFile

Prototype		s32 MfSdkFsClearFile(cchar *FileName);
Function		truncate to 0
Params	in	FileName File Name
	out	None
return		MFSDK_FS_RET_O_K Success
		MFSDK_FS_RET_P_ARM_ERROR Input params NULL
		Other Failed
remark		
demo		

13.28 MfSdkFsDelDirFiles

Prototype		s32 MfSdkFsDelDirFiles(const char* path);
Function		Delete the files in the directory
Params	in	path path
	out	None
return		Ref. MfSdkFsRet_E
remark		
demo		

13.29 MfSdkFsRenameA

Prototype		s32 MfSdkFsRenameA(const char *oldpath, const char *newpath);
------------------	--	---

Function		File or directory rename.	
Params	in	oldpath	old path
	out	newpath	new path
return		Ref. MfSdkFsRet_E	
remark			
demo			

13.30 MfSdkFsGetFileLength

Prototype		LIB_EXPORT s32 MfSdkFsGetFileLength(const char *fileName)	
Function		Get file length.	
Params	in	fileName	File name
	out	None	
return	< 0	Failed	
	>=0	File length	
remark			
demo			

13.31 MfSdkFsRmdir

Prototype		LIB_EXPORT s32 MfSdkFsRmDir(const char *path)	
Function		Remove dir	
Params	in	path	Dir path
	out	None	
return	MFSRK_FS_RET_O	success	
	K		
	Other	fail	
remark			
demo		if(MfSdkFsRmdir("exdata\\testdir") == MFSRK_FS_RET_OK){	

```
// testdir will be removed
}
```

13.32 MfSdkFsOpenDir

Prototype	LIB_EXPORT void *MfSdkFsOpenDir(const char *path)		
Function	Open dir		
Params	in	path	Dir path
	out	None	
return	Dir pointer		success
	NULL		fail
remark			
demo	<pre>void *pdp = MfSdkFsOpenDir(dirname); if(pdp != NULL) { MfSdkDirent_T *ent = NULL; while((ent = MfSdkFsReadDir(pdp)) != NULL) { FS_TRACE("ql_readdir ent->d_type=%d ,ent->d_name: %s ,ent->d_ino:%d\r\n", ent->d_type, ent->d_name, ent->d_ino); } MfSdkFsCloseDir(pdp); } else { FS_TRACE("folder %s does not exist\r\n",dirname); }</pre>		

13.33 MfSdkFsReadDir

Prototype	LIB_EXPORT MfSdkDirent_T* MfSdkFsReadDir(void *dp)		
Function	Read dir		
Params	in	dp	Dir pointer

	out	None
return	pointer	success
	NULL	fail
remark		
demo	<pre>void *pdp = MfSdkFsOpenDir(dirname); if(pdp != NULL) { MfSdkDirenent_T *ent = NULL; while((ent = MfSdkFsReadDir(pdp)) != NULL) { FS_TRACE("ql_readdir ent->d_type=%d ,ent->d_name: %s ,ent->d_ino:%d\r\n", ent->d_type, ent->d_name, ent->d_ino); } MfSdkFsCloseDir(pdp); } else { FS_TRACE("folder %s does not exist\r\n", dirname); }</pre>	

13.34 MfSdkFsCloseDir

Prototype		LIB_EXPORT s32 MfSdkFsCloseDir(void *dp)	
Function		Close dir	
Params	in	path	Dir path
	out	None	
return		Dir pointer	success
		NULL	fail
remark			
demo	<pre>void *pdp = MfSdkFsOpenDir(dirname); if(pdp != NULL) { MfSdkDirenent_T *ent = NULL; while((ent = MfSdkFsReadDir(pdp)) != NULL) { FS_TRACE("ql_readdir ent->d_type=%d ,ent->d_name: %s ,ent->d_ino:%d\r\n", ent->d_type, ent->d_name, ent->d_ino);</pre>		

```
    }
    MfSdkFsCloseDir(pdp);
}
else
{
    FS_TRACE("folder %s does not exist\r\n",dirname);
}
```

14 FIFO module

14.1 Module description

FIFO stands for "First In, First Out," and it refers to a method of organizing and manipulating data structures, particularly in computing and queue management. In a FIFO system, the first item that is added is the first one to be removed. It operates on the principle that the first element added to a collection is the first one to be removed.

14.2 Module structure declaration

```
typedef struct
{
    u32 Outp;        //dequeue pointer
    u32 Inp;         //enqueue pointer
    u8 *pBuff;       //buffer
    u32 nSize;       //FIFO size
    s32 pEvent;      //mutex
}MfSdkFifoData_T;
```

14.3 Constant declarations

```
typedef enum
{
    MFSDK_FIFO_FAILED = -3, //failed
    MFSDK_FIFO_BOUNDS = -2, //Array out-of-bounds
    MFSDK_FIFO_PARM_ERROR = -1, //check param
    MFSDK_FIFO_OK = 0,
}MfSdkFifoRet_E;
```

14.4 MfSdkFifoCreate

Prototype	LIB_EXPORT MFSDKBOOL MfSdkFifoCreate(MfSdkFifoData_T * pstFifo , s32 nSize)				
Function	Create fifo				
Params	in	pstFifo	MfSdkFifoData_T		
		nSize	FIFO size		
	out	Nothing			
return	MFSDK_TRUE Success				
	MFSDK_FALSE Failed				
remark					
demo	<pre>MfSdkFifoData_T playFifo; memset(&playFifo,0,sizeof(MfSdkFifoData_T)); MFSDKBOOL b = MfSdkFifiCreate(&playFifo,4096); if(b) { //TODO success } else { //TODO failed }</pre>				

14.5 MfSdkFifoGet

Prototype	LIB_EXPORT s32 MfSdkFifoGet(MfSdkFifoData_T* pstFifo,u8 * pData , s32 nLen)		
Function	Get FIFO data.		
Params	in	pstFifo	MfSdkFifoData_T
		nLen	pData buffer max size
	out	pData	Get FIFO data
return	> 0 Get FIFO data length		
	other Failed		
remark			
demo			

14.6 MfSdkFifoInit

Prototype		LIB_EXPORT MFSDKBOOL MfSdkFifoInit(MfSdkFifoData_T* pstFifo)	
Function		Init FIFO	
Params	in	pstFifo	MfSdkFifoData_T
	out	Nothing	
return		MFSDK_TRUE	Success
MFSDK_FALSE		Failed	
remark			
demo		<pre>MfSdkFifoData_T playFifo; memset(&playFifo,0,sizeof(MfSdkFifoData_T)); MFSDKBOOL b = MfSdkFifiCreate(&playFifo,4096); if(b) { //TODO success MfSdkFifoInit(&playFifo); } else { //TODO failed }</pre>	

14.7 MfSdkFifoIsEmpty

Prototype		LIB_EXPORT MFSDKBOOL MfSdkFifoIsEmpty(MfSdkFifoData_T* pstFifo)	
Function		Check whether the queue is empty.	
Params	in	pstFifo	MfSdkFifoData_T
	out	Nothing	
return		MFSDK_TRUE	Empty
MFSDK_FALSE		Not empty	

remark	
demo	<pre>MfSdkFifoData_T playFifo; if(MfSdkFifolsEmpty(&pstFifo)) { //TODO Empty }</pre>

14.8 MfSdkFifolsFull

Prototype		LIB_EXPORT MFSDKBOOL MfSdkFifolsFull(MfSdkFifoData_T* pstFifo)	
Function		Check whether the queue is full.	
Params	in	pstFifo	MfSdkFifoData_T
	out	Nothing	
return		MFSDK_TRUE	Full
		MFSDK_FALSE	Not full
remark			
demo		<pre>MfSdkFifoData_T playFifo; if(MfSdkFifolsFull(&pstFifo)) { //TODO Full }</pre>	

14.9 MfSdkFifoPut

Prototype		LIB_EXPORT s32 MfSdkFifoPut(MfSdkFifoData_T* pstFifo, u8 * pData , s32 nLen)	
Function		Insert data to FIFO.	
Params	in	pstFifo	MfSdkFifoData_T
		pData	Insert data buffer
	out	nLen	Insert data buffer length
return		> 0	Actual data length
		< 0	Failed

remark	
demo	<pre>MfSdkFifoData_T playFifo; char data[128] = {0}; Strcpy(data,"volmax.mp3"); s32 ilen = MfSdkFifoPut(&playFifo,data ,strlen(data)); If(ilen != strlen(data)) { //TODO failed }</pre>

14.10 MfSdkFifoResize

Prototype	LIB_EXPORT MFSDKBOOL MfSdkFifoResize(MfSdkFifoData_T * pstFifo , s32 nSize)				
Function	Change the FIFO size.				
Params	in	pstFifo	MfSdkFifoData_T		
		nSize	FIFO size		
	out	Nothing			
return	MFSDK_TRUE Success				
	MFSDK_FALSE Failed				
remark					
demo	<pre>MfSdkFifoData_T playFifo; memset(&playFifo,0,sizeof(MfSdkFifoData_T)); MFSDKBOOL b = MfSdkFifoResize(&playFifo,4096); if(b) { //TODO success } else { //TODO failed }</pre>				

14.11 MfSdkGetFifoNum

Prototype	LIB_EXPORT s32 MfSdkGetFifoNum(MfSdkFifoData_T * pstFifo)
------------------	--

Function		Get the number of elements in the FIFO.	
Params	in	pstFifo	MfSdkFifoData_T
	out	Nothing	
return		> 0	The number of elements in the FIFO
MFSRK_FIFO_PARM_E		Param invalid RROR	
remark			
demo	MfSdkFifoData_T playFifo; s32 fifo_len = MfSdkGetFifoNum(&playFifo);		

14.12 MfSdkGetGetFifoSize

Prototype		LIB_EXPORT s32 MfSdkGetGetFifoSize(MfSdkFifoData_T * pstFifo)	
Function		Get fifo size.	
Params	in	pstFifo	MfSdkFifoData_T
	out	Nothing	
return		> 0	FIFO size
MFSRK_FIFO_PARM_E		Param invalid RROR	
remark			
demo	MfSdkFifoData_T playFifo; s32 fifoSize = MfSdkGetGetFifoSize(&playFifo);		

15 Audio module

15.1 Module description

This module mainly includes Audio APIs.

15.2 Module structure declaration

```
typedef enum
{
    MFSRK_AUD_PLAY_UNIT_MIN = 0,
    MFSRK_AUD_PLAY_UNIT_TEN = MFSRK_AUD_PLAY_UNIT_MIN,
    MFSRK_AUD_PLAY_UNIT_HUNDRED,
```

```
MFSDK_AUD_PLAY_UNIT_THOUSAND,  
MFSDK_AUD_PLAY_UNIT_TEN_THOUSAND,  
MFSDK_AUD_PLAY_UNIT_YUAN,  
MFSDK_AUD_PLAY_UNIT_MAX  
}MfSdkAudPlayUnit_T;
```

15.3 Constant declarations

```
typedef enum  
{  
    MFSDK_AUD_PAY_MIN = 0,  
    MFSDK_AUD_PAY_PROCESSING = MFSDK_AUD_PAY_MIN,  
    MFSDK_AUD_PAY_FAIL,  
    MFSDK_AUD_PAY_SUCCESS,  
    MFSDK_AUD_PAY_SCAN_SUCCESS,  
    MFSDK_AUD_PAY_VOID_SUCCESS,  
    MFSDK_AUD_PAY_MAX,  
}MfSdkAudPayResult_E;  
  
typedef enum  
{  
    MFSDK_AUD_PLAY_NUM_MIN = 0,  
    MFSDK_AUD_PLAY_NUM_ZERO = MFSDK_AUD_PLAY_NUM_MIN,  
    MFSDK_AUD_PLAY_NUM_ONE,  
    MFSDK_AUD_PLAY_NUM_TWO,  
    MFSDK_AUD_PLAY_NUM_THREE,  
    MFSDK_AUD_PLAY_NUM_FOUR,  
    MFSDK_AUD_PLAY_NUM_FIVE,  
    MFSDK_AUD_PLAY_NUM_SIX,  
    MFSDK_AUD_PLAY_NUM_SEVEN,  
    MFSDK_AUD_PLAY_NUM_EIGHT,  
    MFSDK_AUD_PLAY_NUM_NINE,  
    MFSDK_AUD_PLAY_NUM_DOT,  
    MFSDK_AUD_PLAY_NUM_MAX  
}MfSdkAudPlayNum_E;  
  
typedef enum  
{  
    MFSDK_AUD_PAY_TYPE_MIN = 0,  
    MFSDK_AUD_PAY_TYPE_WECHAT =  
MFSDK_AUD_PAY_TYPE_MIN,  
    MFSDK_AUD_PAY_TYPE_ALIPAY,  
    MFSDK_AUD_PAY_TYPE_UNIONPAY,  
    MFSDK_AUD_PAY_TYPE_CARD,
```

```

MFSDK_AUD_PAY_TYPE_SCAN = 7,
MFSDK_AUD_PAY_TYPE_MAX
}MfSdkAudPlayPayType_E;

typedef enum
{
    MFSDK_AUD_RET_FAILED = -3,      //failed
    MFSDK_AUD_RET_BOUNDS = -2,      //Array out-of-bounds
    MFSDK_AUD_RET_PARM_ERROR = -1,   //check param
    MFSDK_AUD_RET_OK = 0,
}MfSdkAudRet_E;

```

15.4 MfSdkAudPlayVoice

Prototype		LIB_EXPORT void MfSdkAudPlayVoice(s8 *msg)
Function		Play Audio file.
Params	in	msg
	out	Nothing
return		Nothing
remark		
demo		

15.5 MfSdkAudPlayAmt

Prototype		LIB_EXPORT s32 MfSdkAudPlayAmt(s32 amount)
Function		Play Amt audio.
Params	in	amount
	out	Nothing
return		Ref. MfSdkAudRet_E
remark		
demo		

15.6 MfSdkAudPlayBatteryLevel

Prototype		LIB_EXPORT s32 MfSdkAudPlayBatteryLevel(void)
Function		Play battery level.
Params	in	Nothing
	out	Nothing
return		Ref. MfSdkAudRet_E
remark		
demo		

15.7 MfSdkAudPlayFile

Prototype		LIB_EXPORT s32 MfSdkAudPlayFile(const s8 * folder, const s8 * sndfile)
Function		Play audio file.
Params	in	Nothing
	out	Nothing
return		Ref. MfSdkAudRet_E
remark		pub_tts_play and pub_tts_playOpt
demo		

15.8 MfSdkAudPlay

Prototype		LIB_EXPORT s32 MfSdkAudPlay(const s8 * sndfile)
Function		Play audio file.
Params	in	sndfile
	out	Nothing
return		Ref. MfSdkAudRet_E
remark		

demo	
------	--

15.9 MfSdkAudPlayNum

Prototype		LIB_EXPORT s32 MfSdkAudPlayNum(MfSdkAudPlayNum_E index)
Function		
Params	in	index
	out	Nothing
return		Ref. MfSdkAudRet_E
remark		
demo		

15.10 MfSdkAudPlayNumber

Prototype		LIB_EXPORT s32 MfSdkAudPlayNumber(s32 num)
Function		
Params	in	num
	out	Nothing
return		Ref. MfSdkAudRet_E
remark		
demo		

15.11 MfSdkAudPlayPayResult

Prototype		LIB_EXPORT s32 MfSdkAudPlayPayResult(MfSdkAudPayResult_E index)
Function		
Params	in	index
	out	Nothing

return	Ref. MfSdkAudRet_E
remark	
demo	

15.12 MfSdkAudPlayPayType

Prototype		LIB_EXPORT s32 MfSdkAudPlayPayType(MfSdkAudPlayPayType_E payType)
Function		
Params	in	index
	out	Nothing
return		Ref. MfSdkAudRet_E
remark		
demo		

15.13 MfSdkAudPlayUnit

Prototype		LIB_EXPORT s32 MfSdkAudPlayUnit(MfSdkAudPlayUnit_T index)
Function		
Params	in	index Ref. MfSdkAudPlayUnit_T
	out	Nothing
return		Ref. MfSdkAudRet_E
remark		
demo		

15.14 MfSdkAudTtsState

Prototype		LIB_EXPORT MFSDKBOOL MfSdkAudTtsState(void)
Function		

Params	in	Nothing	
	out	Nothing	
return		MFSDK_TRUE	success
		MFSDK_FALSE	fail
remark			
demo	<pre>if(MfSdkAudTtsState()) { //busy } else{ //TODO }</pre>		

15.15 MfSdkAudBatchBegin

Prototype	LIB_EXPORT void MfSdkAudBatchBegin(void)				
Function					
Params	in	Nothing			
	out	Nothing			
return	Nothing				
remark	Deprecated				
demo					

15.16 MfSdkAudBatchEnd

Prototype	LIB_EXPORT void MfSdkAudBatchEnd(void)				
Function					
Params	in	Nothing			
	out	Nothing			
return	Nothing				
remark	Deprecated				
demo					

15.17 MfSdkAudClear

Prototype		LIB_EXPORT void MfSdkAudClear(void)	
Function			
Params	in	Nothing	
	out	Nothing	
return		Nothing	
remark			
demo			

15.18 MfSdkAudTtsPlay

Prototype		LIB_EXPORT s32 MfSdkAudTtsPlay(s8 *msg)	
Function		TTS	
Params	in	msg	Text Message
	out	Nothing	
return		Ref. MfSdkAudRet_E	
remark			
demo		MfSdkAudTtsPlay("exdata\\welc.mp3");	

15.19 MfSdkAudSetVolume

Prototype		LIB_EXPORT void MfSdkAudSetVolume(s32 val)	
Function		set audio volume	
Params	in	val	
	out	Nothing	
return		Nothing	
remark			

demo	
------	--

15.20 MfSdkAudSetVolumeRunning

Prototype		LIB_EXPORT void MfSdkAudSetVolumeRunning(s32 val)
Function		Set the volume when playing voice
Params	in	val
	out	Nothing
return		Nothing
remark		
demo		

15.21 MfSdkAudGetVolume

Prototype		LIB_EXPORT s32 MfSdkAudGetVolume()
Function		Get the volume size
Params	in	Nothing
	out	Nothing
return		Volume
remark		
demo		

15.22 MfSdkAudSetSpeed

Prototype		LIB_EXPORT void MfSdkAudSetSpeed(s32 val)
Function		Set audio play speed
Params	in	val
	out	Nothing

return	Nothing
remark	unimplemented
demo	

16 KeyBoard module

16.1 Module description

This module mainly includes APIs related to KeyBoard.

16.2 Module structure declaration

None.

16.3 Constant declarations

```
typedef enum
{
    MFSDK_KB_RET_TIMEOUT = -4, //time over
    MFSDK_KB_RET_FAILED = -3, //failed
    MFSDK_KB_RET_BOUNDS = -2, //Array out-of-bounds
    MFSDK_KB_RET_PARM_ERROR = -1, //check param
    MFSDK_KB_RET_OK = 0,
}MfSdkKbRet_E;

typedef enum
{
    MFSDK_VK_INVALID = -1,

    MFSDK_VK_0 = 0x30,
    MFSDK_VK_1 = 0x31,
    MFSDK_VK_2 = 0x32,
    MFSDK_VK_3 = 0x33,
    MFSDK_VK_4 = 0x34,
    MFSDK_VK_5 = 0x35,
    MFSDK_VK_6 = 0x36,
    MFSDK_VK_7 = 0x37,
    MFSDK_VK_8 = 0x38,
    MFSDK_VK_9 = 0x39,

    MFSDK_VK_CTL = 100,
    MFSDK_VK_UP ,
    MFSDK_VK_DOWN,
    MFSDK_VK_LEFT,
```

```

MFSDK_VK_RIGHT,
MFSDK_VK_F1,
MFSDK_VK_F2,
MFSDK_VK_BACKSPACE,
MFSDK_VK_ESC,
MFSDK_VK_ENTER,
MFSDK_VK_XING, // start
MFSDK_VK_JING, //Hash
}MfSdkKbKeyCode_E;

```

16.4 MfSdkKbKeySetParam

Prototype		LIB_EXPORT void MfSdkKbKeySetParam(int key, int short_press_time, int long_press_time, int short_press_delay)
Function		
Params	in	key
		short_press_time
		long_press_time
		short_press_delay
return	out	Nothing
		Nothing
remark		
demo		

16.5 MfSdkKbGetKeySound

Prototype		LIB_EXPORT s32 MfSdkKbGetKeySound()
Function		
Params	in	Nothing
	out	Nothing
return	0	close
	1	open
remark		

demo	
------	--

16.6 MfSdkKbSetKeySound

Prototype		LIB_EXPORT void MfSdkKbSetKeySound(s32 nOpen)	
Function			
Params	in	nOpen	1 open; 0 close
	out	Nothing	
return		Nothing	
remark			
demo			

16.7 MfSdkKbWaitKey

Prototype		LIB_EXPORT s32 MfSdkKbWaitKey(s32 TimeOut)	
Function		Waiting button, waits for the button within the set time, while the Nothing button waits for the timeout.	
Params	in	TimeOut	Waiting timeout time (seconds), 0 means blocking
	out	Nothing	
return		>=0	key value
		Other	fail
remark			
demo			

17 Lcd module

17.1 Module description

This module mainly includes APIs related to LCD.

17.2 Module structure declaration

None.

17.3 Constant declarations

```
typedef enum
{
    MFSDK_LCD_OFF = 0, //turn off backlight
    MFSDK_LCD_AUTO = 1, // system automatically controls
    MFSDK_LCD_ON = 2, //backlight is always bright
}MfSdkLcdStatus_E;

typedef enum
{
    MFSDK_LCD_RET_FAILED = -3, //failed
    MFSDK_LCD_RET_BOUNDS = -2, //Array out-of-bounds
    MFSDK_LCD_RET_PARM_ERROR = -1, //check param
    MFSDK_LCD_RET_OK = 0, //success
}MfSdkLcdRet_E;

typedef enum
{
    MFSDK_LCD_BRT_LEVEL_MIN = 0,
    MFSDK_LCD_BRT_LEVEL_1,
    MFSDK_LCD_BRT_LEVEL_2,
    MFSDK_LCD_BRT_LEVEL_3,
    MFSDK_LCD_BRT_LEVEL_4,
    MFSDK_LCD_BRT_LEVEL_MAX,
}MfSdkLcdBrighnesstLevel_E;

typedef enum
{
    MFSDK_LCD_ARROW_UP = 0, //up arrow
    MFSDK_LCD_ARROW_DOWN = 1, //down arrow
}MfSdkLcdArrow_E;
```

17.4 MfSdkLcdBackLight

Prototype	LIB_EXPORT s32 MfSdkLcdBackLight(s32 status)		
Function			
Params	in	status	Ref. MfSdkLcdStatus_E

		MFSDK_LCD_OFF-OFF, MFSDK_LCD_ON-ON
out	Nothing	
return	Ref. MfSdkLcdRet_E	
remark		
demo		

17.5 MfSdkLcdSegmentBackLight

Prototype		LIB_EXPORT s32 MfSdkLcdSegmentBackLight(s32 status)		
Function		Segment code LCD		
Params	in	status	Ref. MfSdkLcdStatus_E	MFSDK_LCD_OFF-OFF, MFSDK_LCD_ON-ON
	out	Nothing		
return		Ref. MfSdkLcdRet_E		
remark				
demo				

17.6 MfSdkLcdGetSubProbe

Prototype		LIB_EXPORT s32 MfSdkLcdGetSubProbe()		
Function				
Params	in	Nothing		
	out	Nothing		
return		Ref. MfSdkLcdRet_E		
remark		unimplemented		
demo				

17.7 MfSdkLcdSetIndex

Prototype		LIB_EXPORT void MfSdkLcdSetIndex(s32 index)
Function		
Params	in	index
	out	Nothing
return		Nothing
remark		unimplemented
demo		

17.8 MfSdkLcdGetPowerDownTime

Prototype		LIB_EXPORT s32 MfSdkLcdGetPowerDownTime()
Function		Get the shutdown time
Params	in	Nothing
	out	Nothing
return		Shutdown time
remark		
demo		

17.9 MfSdkLcdSetPowerDownTime

Prototype		LIB_EXPORT void MfSdkLcdSetPowerDownTime(s32 ntime)
Function		Set the shutdown time
Params	in	ntime Shutdown time unit: second
	out	Nothing
return		Nothing
remark		

demo	
------	--

17.10 MfSdkLcdGetBackLightTime

Prototype		LIB_EXPORT s32 MfSdkLcdGetBackLightTime()
Function		Get BackLight time
Params	in	Nothing
	out	Nothing
return		Backlight time
remark		
demo		

17.11 MfSdkLcdSetBackLightTime

Prototype		LIB_EXPORT void MfSdkLcdSetBackLightTime(s32 ntime)
Function		Set backlight time
Params	in	ntime Backlight time
	out	Nothing
return		Nothing
remark		
demo		

17.12 MfSdkLcdGetFrontBackLightTime

Prototype		s32 MfSdkLcdGetFrontBackLightTime();
Function		Get Front Screen Backlight time (for MP70A6)
Params	in	None
	out	None

return	Backlight time
remark	
demo	

17.13 MfSdkLcdSetFrontBackLightTime

Prototype	void MfSdkLcdSetFrontBackLightTime(s32 ntime);		
Function	Set Front Screen Backlight time (for MP70A6)		
Params	in	ntime	Backlight time,max value 99999999 unit:second
	out	None	
return	None		
remark			
demo			

17.14 MfSdkLcdGetRearBackLightTime

Prototype	s32 MfSdkLcdGetRearBackLightTime();		
Function	Get Rear Screen Backlight time (for MP70A6)		
Params	in	None	
	out	None	
return	Backlight time		
remark			
demo			

17.15 MfSdkLcdSetRearBackLightTime

Prototype	void MfSdkLcdSetRearBackLightTime(s32 ntime);
------------------	--

Function		Set Rear Screen Backlight time (for MP70A6)	
Params	in	ntime	Backlight time,max value 99999999 unit:second
	out	None	
return		None	
remark			
demo			

17.16 MfSdkLcdBrightnessLevelSettings

Prototype	s32 MfSdkLcdBrightnessLevelSettings(MfSdkLcdBrighnesstLevel_E level);		
Function	Screen Brightness Level Settings		
Params	in	level	MfSdkLcdBrighnesstLevel_E level 0~5
	out	None	
return	Refer to MfSdkLcdRet_E		
remark			
demo			

17.17 MfSdkLcdAutoFlush

Prototype	s32 MfSdkLcdAutoFlush(MFSDKBOOL bValue);		
Function	Whether to auto Refresh the LCD		
Params	in	bValue	true-enble flush lcd,false-disable flush lcd
	out	None	
return	Refer to MfSdkLcdRet_E		
remark			
demo			

17.18 MfSdkLcdSetNormalDirection

Prototype		s32 MfSdkLcdSetNormalDirection();
Function		Return to normal display
Params	in	None
	out	None
return		Refer to MfSdkLcdRet_E
remark		
demo		

17.19 MfSdkLcdArrowDisplay

Prototype		void MfSdkLcdArrowDisplay(MfSdkLcdArrow_E index, MFSDKBOOL enable);
Function		Status Bar Display Up/Down Arrow.only support SR600mini
Params	in	index 0:up,1:down enable 1:on,0:off
	out	None
return		None
remark		
demo		

17.20 MfSdkLcdBacklightIsBright

Prototype		MFSDKBOOL MfSdkLcdBacklightIsBright();
Function		Check the screen backlight status
Params	in	None
	out	None
return		1 on

	0 off
remark	
demo	

18 Log module

18.1 Module description

This module mainly includes APIs about log output.

18.2 Module structure declaration

None.

18.3 Constant declarations

```
//close log output
#define MFSDK_LOG_CLOSE_OUT (0)
//The logs will be output from the USB port
#define MFSDK_LOG_USB_OUT (1)
//The logs will be output from the wifi port
#define MFSDK_LOG_WIFI_OUT (2)

typedef enum
{
    MFSDK_LOG_LEVEL_TRACE = 0, //trace
    MFSDK_LOG_LEVEL_DEBUG, //debug
    MFSDK_LOG_LEVEL_INFO, //info
    MFSDK_LOG_LEVEL_WARN, //warning
    MFSDK_LOG_LEVEL_ERROR, //error
    MFSDK_LOG_LEVEL_FATAL,
    MFSDK_LOG_LEVEL_FILE,
}MfSdkLogLevel_E;
```

18.4 MfSdkLogSoundSet

Prototype	LIB_EXPORT s32 MfSdkLogSoundSet(s32 val)
Function	Set the log output mode

Params	in	val	MFSDK_LOG_USB_OUT/MFSDK_LOG_WIFI_OUT
	out	Nothing	
return		0	success
remark			
demo			

18.5 MfSdkLog

Prototype	LIB_EXPORT void MfSdkLog(const char *pTag,const char *fmt,...)				
Function	module is "MFSDKLOG"				
Params	in	pTag			
		fmt			
		...			
	out	Nothing			
return	Nothing				
remark	default level:MFSDK_LOG_LEVEL_TRACE				
demo					

18.6 MfSdkLogTip

Prototype	LIB_EXPORT void MfSdkLogTip(const char* module, MfSdkLogLevel_E level, const void* Buffer, s32 nSize, char* tip, s32 breakline)				
Function					
Params	in	module			
		level			
		Buffer			
		nSize			
		tip			
	breakline				
out	Nothing				
return	Nothing				

remark	
demo	

18.7 MfSdkLogHexBuff

Prototype		LIB_EXPORT void MfSdkLogHexBuff(const char* module, MfSdkLogLevel_E level,s8*Buffer, s32 nSize)
Function		
Params	in	module
		level
		Buffer
		nSize
Params	out	Nothing
return		Nothing
remark		
demo		

18.8 MfSdkLogLevel

Prototype		LIB_EXPORT void MfSdkLogLevel(const char* module, MfSdkLogLevel_E level, const char* fmt, ...)
Function		
Params	in	module
		level
		fmt
		...
Params	out	Nothing
return		Nothing
remark		
demo		

18.9 MfSdkLogOutputSwitch

Prototype		void MfSdkLogOutputSwitch(MFSKBOOL enable);	
Function		default enable	
Params	in	val	MFSDK_TRUE: enable output of logs , MFSDK_FALSE: disenable output of logs
	out	Nothing	
return		Nothing	
remark			
demo			

19 Power module

19.1 Module description

This module mainly includes APIs about power, battery and backlight time set.

19.2 Module structure declaration

None.

19.3 Constant declarations

```

typedef enum
{
    MFSDK_POWER_RET_UNSUPORT = -4, // dont support
    MFSDK_POWER_RET_FAILED = -3, //failed
    MFSDK_POWER_RET_BOUNDS = -2, //Array out-of-bounds
    MFSDK_POWER_RET_PARM_ERROR = -1, //check param
    MFSDK_POWER_RET_OK = 0, //success
}MfSdkPowerRet_E;

typedef enum{
    MFSDK_POWER_POWER_MANAGER_REBOOT,
    MFSDK_POWER_POWER_MANAGER_SHUTDOWN,
    MFSDK_POWER_MANAGER_ENTER_PAGE = 4,
}

```

```

}MfSdkPowerManagerType_E;

typedef enum {
    MFSDK_POWER_SUPPLY_CAPACITY_LEVEL_UNKNOWN = 0,
    MFSDK_POWER_SUPPLY_CAPACITY_LEVEL_CRITICAL,
    MFSDK_POWER_SUPPLY_CAPACITY_LEVEL_LOW,
    MFSDK_POWER_SUPPLY_CAPACITY_LEVEL_NORMAL,
    MFSDK_POWER_SUPPLY_CAPACITY_LEVEL_HIGH,
    MFSDK_POWER_SUPPLY_CAPACITY_LEVEL_FULL,
}MfSdkPowerCapacityLevel_E;

typedef enum
{
    MFSDK_POWER_LOW_BATTERY_REMID = 0,
    MFSDK_POWER_LOW_BATTERY_SHUTDOWN,
}
MfSdkPowerPageParm_E;

typedef enum
{
    MFSDK_POWER_ACONLINE_SLEEP_DN = 0, // Unable to sleep
when connected to external power
    MFSDK_POWER_ACONLINE_SLEEP_EN = 1, // Enable to sleep
when connected to external power
}MfSdkPowerSleep_E;
typedef s32 (*MfSdkPowerResumeProcCb)(s32 ret);
typedef s32 (*MfSdkPowerManagerCb)(MfSdkPowerManagerType_E
type);
typedef void(*MfSdkPowerPageCbFunc)(int);

```

19.4 MfSdkPowerResumeProc

Prototype		LIB_EXPORT s32 MfSdkPowerResumeProc(MfSdkPowerResumeProcCb pFuncCb)
Function		set resume callback
Params	in	pFuncCb
	out	Nothing
return		Ref. MfSdkPowerRet_E
remark		

demo	
------	--

19.5 MfSdkPowerManagerSetFunc

Prototype		<code>void MfSdkPowerManagerSetFunc(MfSdkPowerManagerCb cb);</code>	
Function		set power manager callback	
Params	in	cb	power manager callback
	out	Nothing	
return		None	
remark			
demo			

19.6 MfSdkPowerLockApp

Prototype		<code>LIB_EXPORT s32 MfSdkPowerLockApp(char *sfun)</code>	
Function			
Params	in	sfun	
	out	Nothing	
return		Ref. MfSdkPowerRet_E	
remark			
demo			

19.7 MfSdkPowerUnlockApp

Prototype		<code>LIB_EXPORT void MfSdkPowerUnlockApp(void)</code>	
Function			
Params	in	Nothing	
	out	Nothing	

return	Nothing
remark	
demo	

19.8 MfSdkPowerTaskInit

Prototype		LIB_EXPORT s32 MfSdkPowerTaskInit(s32 taskid)	
Function			
Params	in	taskid	
	out	Nothing	
return		Ref. MfSdkPowerRet_E	
remark			
demo			

19.9 MfSdkPowerTaskSuspend

Prototype		LIB_EXPORT s32 MfSdkPowerTaskSuspend(s32 taskid , s32 ms)	
Function		Sleep is possible within xx ms	
Params	in	taskid	Task ID
		ms	ms (unit:ms)
return		Ref. MfSdkPowerRet_E	
remark			
demo			

19.10 MfSdkPowerReset

Prototype	LIB_EXPORT s32 MfSdkPowerReset(void)
------------------	--------------------------------------

Function		Restart device.
Params	in	
	out	
return		Ref. MfSdkPowerRet_E
remark		
demo		

19.11 MfSdkPowerPageCb

Prototype		LIB_EXPORT s32 MfSdkPowerPageCb(MfSdkPowerPageCbFunc fun)
Function		The device start-up callback.
Params	in	fun
	out	Nothing
return		Ref. MfSdkPowerRet_E
remark		
demo		

19.12 MfSdkPowerPageInit

Prototype		LIB_EXPORT s32 MfSdkPowerPageInit(void* state, lv_align_t align, lv_coord_t x_ofs, lv_coord_t y_ofs)
Function		
Params	in	state
		align
		x_ofs
		y_ofs
	out	Nothing
return		Ref. MfSdkPowerRet_E
remark		
demo		

19.13 MfSdkPowerSetTime

Prototype		LIB_EXPORT void MfSdkPowerSetTime(s32 time_num)	
Function		Set the sleep mode time	
Params	in	time_num	Sleep mode time(unit: second)
	out	Nothing	
return		Nothing	
remark			
demo			

19.14 MfSdkPowerOff

Prototype		LIB_EXPORT void MfSdkPowerOff(void)	
Function		Power off	
Params	in	Nothing	
	out	Nothing	
return		Nothing	
remark			
demo			

19.15 MfSdkPowerKeySetLight

Prototype		LIB_EXPORT void MfSdkPowerKeySetLight()	
Function			
Params	in	Nothing	
	out	Nothing	
return		Nothing	
remark			

demo	
------	--

19.16 MfSdkPowerGetBatteryPercentage

Prototype		LIB_EXPORT s32 MfSdkPowerGetBatteryPercentage()	
Function		Get the battery percentage.	
Params	in	Nothing	
	out	Nothing	
return	0-100	Battery Percentage	
	MFSDK_POWER_RET_F AILED	fail	
remark			
demo			

19.17 MfSdkPowerSetBacklightTime

Prototype		LIB_EXPORT s32 MfSdkPowerSetBacklightTime(s32 seconds)	
Function		set turn off backlight time	
Params	in	seconds	
	out	Nothing	
return	MFSDK_POWER_RET_ OK	success	
	Other	fail,Ref.MfSdkPowerRet_E	
remark			
demo			

19.18 MfSdkPowerSupertimeReset

Prototype	LIB_EXPORT s32 MfSdkPowerSupertimeReset(void)
------------------	---

Function		reset backlight time	
Params	in	Nothing	
	out	Nothing	
return	MFSDK_POWER_RET_OK	success	
	Other	fail,Ref.MfSdkPowerRet_E	
remark			
demo			

19.19 MfSdkPowerSwitchResetTick

Prototype		s32 MfSdkPowerSwitchResetTick(void);
Function		Reset the sleep timer
Params	in	Nothing
	out	Nothing
		Ref.MfSdkPowerRet_E
remark		
demo		

19.20 MfSdkPowerSleepSwitch

Prototype		void MfSdkPowerSleepSwitch(MfSdkPowerSleep_E switchE);
Function		set sleep
Params	in	switchE MFSDK_POWER_ACONLINE_SLEEP_EN:enable, MFSDK_POWER_ACONLINE_SLEEP_DN:disable
	out	Nothing
		Nothing
remark		

demo	
------	--

20 QR module

20.1 Module description

This module mainly includes APIs about QR & Scanner operations.

20.2 Module structure declaration

None.

20.3 Constant declarations

```
typedef enum
{
    MFSDK_QR_RET_DECODE_FAILED = -4, //decode failed
    MFSDK_QR_RET_FAILED = -3, //failed
    MFSDK_QR_RET_BOUNDS = -2, //Array out-of-bounds
    MFSDK_QR_RET_PARM_ERROR = -1, //check param
    MFSDK_QR_RET_OK = 0,
}MfSdkQrRet_E;
```

20.4 MfSdkQrDecode

Prototype	LIB_EXPORT s32 MfSdkQrDecode(s8* code, s32 size)				
Function	Get scan data				
Params	in	size	scan size		
	out	code	scan data		
return	MFSDK_QR_RET_FAILED	not found camera			
	MFSDK_QR_RET_DECODE_FAILED	decode failed			
	> 0	decode data length			
remark					
demo					

20.5 MfSdkQrScannerClose

Prototype		LIB_EXPORT s32 MfSdkQrScannerClose(void)	
Function		Close scanner	
Params	in	Nothing	
	out	Nothing	
return		MFSDK_QR_RET_OK	success
		Other	fail
remark			
demo			

20.6 MfSdkQrScannerGetImg

Prototype		LIB_EXPORT s8* MfSdkQrScannerGetImg(void)	
Function		Get scan image	
Params	in	Nothing	
	out	Nothing	
return		scan image	
		(MF960: 480*640)	
remark			
demo			

20.7 MfSdkQrScannerOpen

Prototype		LIB_EXPORT s32 MfSdkQrScannerOpen(void)	
Function		Open scanner	
Params	in	Nothing	
	out	Nothing	
return		MFSDK_QR_RET_OK	success

	Other	fail
remark		
demo		

20.8 MfSdkQrSetScanBoxPosition

Prototype	void MfSdkQrSetScanBoxPosition(s32 x, s32 y);		
Function	Set scanner preview position		
Params	in	x	x offset
		y	y offset
out	Nothing		
return	Nothing		
remark			
demo			

20.9 MfSdkQrScannerStart

Prototype	LIB_EXPORT s32 MfSdkQrScannerStart(void)		
Function	Start scanner		
Params	in	Nothing	
		out	Nothing
return	MFSDK_QR_RET_OK success		
	Other fail		
remark			
demo			

20.10 MfSdkQrScannerStop

Prototype	LIB_EXPORT s32 MfSdkQrScannerStop(void)		
------------------	--	--	--

Function		Stop scanner	
Params	in	Nothing	
	out	Nothing	
return		MFSDK_QR_RET_OK	success
		Other	fail
remark			
demo			

20.11 MfSdkQrScannerSetPreview

Prototype		LIB_EXPORT void MfSdkQrScannerSetPreview(int value)	
Function		Set scaner preview	
Params	in	value	1:open 0:close
	out	Nothing	
return		Nothing	
remark			
demo			

21 TMS module

21.1 Module description

This module mainly includes APIs about TMS operations.

21.2 Module structure declaration

None.

21.3 Constant declarations

```
typedef enum
{
    MFSDK_TMS_RET_FAILED = -3, //failed
    MFSDK_TMS_RET_BOUNDS = -2, //Array out-of-bounds
    MFSDK_TMS_RET_PARM_ERROR = -1, //check param
```

```
MFSDK_TMS_RET_OK = 0, //success
}MfSdkTmsRet_E;

typedef enum
{
    MFSDK_TMS_UPGRADE_DATA = 0, //0 upgrade data only
    MFSDK_TMS_UPGRADE_APP, //1 upgrade application
}MfSdkTmsUpdateType_E;

typedef enum
{
    MFSDK_TMS_APP_NOT_BUSY = 0,
    MFSDK_TMS_APP_STATE_BUSY,
}MfSdkTmsAppState_E;

typedef enum
{
    MFSDK_TMS_OTA_LOCAL_FLASH = 0, //download OTA package
in Flash
    MFSDK_TMS_OTA_LOCAL_RAM, //download OTA package
in RAM
}MfSdkTmsOtaLocal_E;

typedef enum
{
    MFSDK_TMS_ACTION_DOWNLOADING = 0, //tms downloading
    MFSDK_TMS_ACTION_UPDATEING, //Prepare to upgrade the
downloaded program
    MFSDK_TMS_ACTION_CALLBACK, //App add tms download
progress callback
}MfSdkTmsAction_E;

enum {
    MFSDK_TMS_WAIT_TASK = 0, // wait task
    MFSDK_TMS_WAIT_NETWORK_LINK, // wait network link
    MFSDK_TMS_NETWORK_ANOMALY, // network anomaly
    MFSDK_TMS_CONNETING, // conneting
    MFSDK_TMS_CONNET_FAILED, // connect failed
    MFSDK_TMS_REQUEST, // request
    MFSDK_TMS RECEIVING, // receiving
    MFSDK_TMS_RECEIVED, // received
    MFSDK_TMS_LOGON_FAILURE, // logon faliure
    MFSDK_TMS_ILLEGAL_EQUIPMENT, // illegal equipment
```

```

MFSDK_TMS_FAILURE_SEND,           // failure send
MFSDK_TMS_FAILURE_RECV,          //failure recv
MFSDK_TMS_DOWNLOAD,              // download
MFSDK_TMS_DOWNLOADING,            // downloading
MFSDK_TMS_DOWNLOAD_LIMIT,         // download limit
MFSDK_TMS_ERROR_FORMAT,           // error format
MFSDK_TMS_MD5_ERROR_TRY,          // md5 error try
MFSDK_TMS_DOWNLOAD_COMPLETED,     // download completed
MFSDK_TMS_DOWNLOAD_CANCEL,        // download cancel
MFSDK_TMS_VALIDATION_FAILURE,    // validation failure
MFSDK_TMS_VERIFICATION_SIGNATURE, //verification signature
MFSDK_TMS_NONEED_TO_UPDATE,      // no need to update
MFSDK_TMS_NEW_VERSION,            // new version
MFSDK_TMS_UPDATING,               // updating
MFSDK_TMS_WIFI_UPGRADE,           // wifi upgrade
MFSDK_TMS_UPDATE_SUCCESS,         // update success
MFSDK_TMS_UPDATE_FAILED,          // update failed
MFSDK_TMS_REBOOTING,              // rebooting

}MfSdkTmsResult_E;
/***
 * @brief
 * @param[in] int current value
 * @param[in] int total value
 */
typedef void (*MfSdkTmsProgressCb)(int, int);
/***
 * @brief
 * @param[in] int result type
 */
typedef void (*MfSdkTmsResultCb)(int);
/***
 * @brief
 * @param[in] int result type
 * @return 1 : continue
 */
typedef s32 (*MfSdkTmsActionCb)(MfSdkTmsAction_E type);

```

21.4 MfSdkTmsSetProgressCallback

Prototype	LIB_EXPORT void MfSdkTmsSetProgressCallback(MfSdkTmsProgressCb pFunCallback)
------------------	---

Function		Set TMS progress callback function
Params	in	Nothing
	out	Nothing
return		Nothing
remark		
demo		

21.5 MfSdkTmsSetResultCallback

Prototype		void MfSdkTmsSetResultCallback(MfSdkTmsResultCb pFunCallback);
Function		tms result callback
Params	in	pFunCallback Callback
	out	Nothing
return		Nothing
remark		
demo		

21.6 MfSdkTmsHeartBeat

Prototype		LIB_EXPORT s32 MfSdkTmsHeartBeat()
Function		TMS heartBeat
Params	in	Nothing
	out	Nothing
return		MFSDK_TMS_RET_OK success Other fail
remark		
demo		

21.7 MfSdkTmsUpdate

Prototype		LIB_EXPORT void MfSdkTmsUpdate(void)
Function		TMS Update
Params	in	Nothing
	out	Nothing
return		Nothing
remark		
demo		

21.8 MfSdkTmsUpdateFile

Prototype		LIB_EXPORT s32 MfSdkTmsUpdateFile(const s8* file, MfSdkTmsUpdateType_E flag)
Function		
Params	in	file
		flag
out		Nothing
return		
remark		
demo		

21.9 MfSdkTmsAppBusy

Prototype		LIB_EXPORT void MfSdkTmsAppBusy(MfSdkTmsAppState_E nBusyState)
Function		Set TMS state
Params	in	nBusyState
	out	Nothing
return		Nothing

remark	
demo	

21.10 MfSdkTmsCheckTimeDisable

Prototype		LIB_EXPORT void MfSdkTmsCheckTimeDisable()
Function		Disable check time from tms server.Only for traditional POS.
Params	in	nBusyState
	out	Nothing
return		Nothing
remark		
demo		

21.11 MfSdkTmsGetMsg

Prototype		LIB_EXPORT s8 *MfSdkTmsGetMsg()
Function		Gets the current tms message
Params	in	Nothing
	out	Nothing
return		tms msg string
remark		
demo		

21.12 MfSdkTmsGetResult

Prototype		LIB_EXPORT s8 *MfSdkTmsGetResult()
Function		Get tms result information
Params	in	Nothing

	out	Nothing
return		tms result string
remark		
demo		

21.13 MfSdkTmsSetSig

Prototype		LIB_EXPORT void MfSdkTmsSetSig(s32 flag);
Function		Whether the tms upgrade verifies the signature.(For traditional POS, Soundbox not applicable)
Params	in	s32 flag 0-enable ,1-disable
	out	Nothing
return		none
remark		
demo	MfSdkTmsSetSig(0)/MfSdkTmsSetSig(1);	

21.14 MfSdkTmsUpdateOta

Prototype		s32 MfSdkTmsUpdateOta(char *filename,char *flag);
Function		update OTA
Params	in	filename download file path and name eg. "exdata\\down.tmp"
		flag fix string "ota.bin"
	out	Nothing
return		MFSDK_TMS_RET_OK success
		other fail
remark		
demo		

21.15 MfSdkTmsSetConnectRetryCnt

Prototype		void MfSdkTmsSetConnectRetryCnt(u32 count);
Function		Set TMS connect retry count
Params	in	none
	out	none
return		none
remark		
demo		

21.16 MfSdkTmsSetErrorRetryCnt

Prototype		void MfSdkTmsSetErrorRetryCnt(u32 count);
Function		Set TMS error retry count
Params	in	none
	out	none
return		none
remark		
demo		

21.17 MfSdkTmsEnable

Prototype		void MfSdkTmsEnable(MFSKDBOOL b);
Function		Whether to enable the TMS service. Default support for TMS.
Params	in	b MFSDK_TRUE-enable , MFSDK_FALSE-disable
	out	none
return		none

remark	
demo	//if disable TMS MfSdkTmsEnable(MFSRK_FALSE);

21.18 MfSdkTmsSetActionCallback

Prototype		s32 MfSdkTmsSetActionCallback(MfSdkTmsActionCb pFunCallback);	
Function		Set TMS action progress callback function	
Params	in	pFunCallback	Callback
	out	none	
return		For details, see MfSdkTmsResult_E	
remark			
demo			

21.19 MfSdkTmsEnableSyncTime

Prototype		void MfSdkTmsEnableSyncTime(MFSRKBOOL b);	
Function		Whether to synchronize TMS time (enabled by default).Only for Soundbox.	
Params	in	b	MFSDK_TRUE - enable MFSDK_FALSE - disable
	out	none	
return			
remark			
demo			

22 LVGL module

22.1 Module description

This module mainly includes APIs about LVGL functions.

22.2 Module structure declaration

None.

22.3 Constant declarations

```
typedef enum
{
    MFSDK_LVGL_OPER_SUCC = 0,
    MFSDK_LVGL_OPER_FAIL = -1,
    MFSDK_LVGL_OPER_CANCEL = -2,
    MFSDK_LVGL_OPER_TIMEOUT = -3,
    MFSDK_LVGL_OPER_BACKSPACE = -4,
} MfSdkLvglOper_E;

typedef enum
{
    MFSDK_LVGL_LARGE_FONT = 2,
    MFSDK_LVGL_NORMAL_FONT = 1,
    MFSDK_LVGL_SMALL_FONT = 0,
} MfSdkLvglFont_E;

typedef enum
{
    MFSDK_LVGL_ALIGN_RIGHT = 2,
    MFSDK_LVGL_ALIGN_CENTER = 1,
    MFSDK_LVGL_ALIGN_LEFT = 0,
} MfSdkLvglAlign_E;

typedef enum
{
    MFSDK_LVGL_INPUT_MODE_NUM = 0,
    MFSDK_LVGL_INPUT_MODE_TEXT = 1,
    MFSDK_LVGL_INPUT_MODE_IP = 2,
```

```
    MFSDK_LVGL_INPUT_MODE_PWD = 3,  
    MFSDK_LVGL_INPUT_MODE_AMOUNT = 4,  
} MfSdkLvglInput_E;  
  
typedef enum  
{  
    MFSDK_LVGL_INPUTTEXT_IMAGE = 0,  
  
}MfSdkLvglImageType_E;  
  
typedef enum {  
    MFSDK_LVGL_SB_320_240_BLACK = 0, //320*240  
    MFSDK_LVGL_SB_320_240_WHITE = 1, //320*240  
    MFSDK_LVGL_SB_480_800_BLACK = 4, //480*800  
    MFSDK_LVGL_SB_480_800_WHITE = 5, //480*800  
}MfSdkLvglStatusBar_E;  
  
typedef enum  
{  
    MFSDK_LVGL_NETMENU_EXIT_TIMEOUT = -1,  
    MFSDK_LVGL_NETMENU_EXIT_CANCEL = 0,  
    MFSDK_LVGL_NETMENU_NETINFO_EXIT,  
    MFSDK_LVGL_NETMENU_NETSET1_EXIT_TIMEOVER,  
    MFSDK_LVGL_NETMENU_NETSET1_EXIT,  
    MFSDK_LVGL_NETMENU_NET4G_ALREADY_EXIT,  
    MFSDK_LVGL_NETMENU_NET4G_FAILED_NO_SIM,  
    MFSDK_LVGL_NETMENU_NET4G_FAILED_EXIT_TIMEOVER,  
    MFSDK_LVGL_NETMENU_NET4G_SUCCEED_EXIT,  
    MFSDK_LVGL_NETMENU_NETWIFI_FAILED_EXIT_TIMEOVER,  
    MFSDK_LVGL_NETMENU_NETWIFI_SUCCEED_EXIT,  
    MFSDK_LVGL_NETMENU_NETADDWIFI_EXIT_TIMEOVER,  
    MFSDK_LVGL_NETMENU_NETADDWIFI_EXIT,  
    MFSDK_LVGL_NETMENU_NETWIFISAVE_EXIT_TIMEOVER,  
    MFSDK_LVGL_NETMENU_NETWIFISAVE_EXIT,  
    MFSDK_LVGL_NETMENU_NETWIFI_SWITCH_FAILED_EXIT_TIME  
OVER,  
    MFSDK_LVGL_NETMENU_NETWIFI_SWITCH_FAILED_EXIT,  
    MFSDK_LVGL_NETMENU_NETWIFISCANING_EXIT_TIMEOVER,  
    MFSDK_LVGL_NETMENU_NETWIFISCANING_EXIT,  
    MFSDK_LVGL_NETMENU_NETWIFILIST_EXIT_TIMEOVER,  
    MFSDK_LVGL_NETMENU_NETWIFILIST_EXIT,  
    MFSDK_LVGL_NETMENU_NETWIFIINPUTPASSWORD_EXIT_TIME  
OVER,
```

```

MFSDK_LVGL_NETMENU_NETWIFIINPUTPASSWORD_EXIT,
MFSDK_LVGL_NETMENU_NETWIFICONNECT_SUCCEED_EXIT,
MFSDK_LVGL_NETMENU_NETWIFICONNECT_FAILED_EXIT,
}MfSdkLvglNetMenuExitValue_E;

```

22.4 MfSdkLvglInit

Prototype		LIB_EXPORT s32 MfSdkLvglInit(void)	
Function		lvgl module initialization	
Params	in	Nothing	
	out	Nothing	
return		0	success
		Other	fail
remark			
demo			

22.5 MfSdkLvglGetPageBody

Prototype		LIB_EXPORT lv_obj_t* MfSdkLvglGetPageBody()	
Function		Get the modal lvgl page parent object	
Params	in	Nothing	
	out	Nothing	
return		0	fail
		Other	success,lvgl page parent object
remark			
demo			

22.6 MfSdkLvglExit

Prototype	LIB_EXPORT s32 MfSdkLvglExit(void)
------------------	---

Function		lvgl module exit	
Params	in	Nothing	
	out	Nothing	
return	0	success	
	Other	fail	
remark			
demo			

22.7 MfSdkLvglCls

Prototype		LIB_EXPORT void MfSdkLvglCls(void)	
Function		clear screen	
Params	in	Nothing	
	out	Nothing	
return		Nothing	
remark			
demo			

22.8 MfSdkLvglClsEnableStatusBar

Prototype		LIB_EXPORT void MfSdkLvglClsEnableStatusBar(s32 status)	
Function		enable status bar	
Params	in	status	0 - off, 1 - on
	out	Nothing	
return		Nothing	
remark			
demo			

22.9 MfSdkLvgIEnableDefaultStatusBarIcons

Prototype		LIB_EXPORT void MfSdkLvgIEnableDefaultStatusBarIcons(s32 status)	
Function		enable default status bar icons	
Params	in	status	0 - off, 1 - on
	out	Nothing	
return		Nothing	
remark			
demo			

22.10 MfSdkLvgIClearLine

Prototype		LIB_EXPORT void MfSdkLvgIClearLine(s32 lineNo)	
Function		clear specified line	
Params	in	lineNo	line number(starting from 0)
	out	Nothing	
return		Nothing	
remark			
demo			

22.11 MfSdkLvgIGetStatusBarHeight

Prototype		LIB_EXPORT s32 MfSdkLvgIGetStatusBarHeight()	
Function		get status bar height	
Params	in	Nothing	
	out	Nothing	
return		height	
remark			

demo	
-------------	--

22.12 MfSdkLvgICreateButtons

Prototype	LIB_EXPORT s32 MfSdkLvgICreateButtons(MfSdkLvgIButtons_T items[], s32 size)
Function	create buttons
Params	in items create buttons parameter.If items->id < 0 is not clickable
	size items size
	out Nothing
return	height
remark	
demo	

22.13 MfSdkLvgIClearAll

Prototype	LIB_EXPORT void MfSdkLvgIClearAll(void)				
Function	clear screen without line 0				
Params	<table border="1"><tr><td>in</td><td>Nothing</td></tr><tr><td>out</td><td>Nothing</td></tr></table>	in	Nothing	out	Nothing
in	Nothing				
out	Nothing				
return	Nothing				
remark					
demo					

22.14 MfSdkLvg!WaitKey

Prototype	LIB_EXPORT s32 MfSdkLvg!WaitKey(s32 timeout)
Function	waiting for key pressed

Params	in	timeout	timeout(second)
	out	Nothing	
return		>=0	success, key value or button id
		Other	fail
remark			
demo			

22.15 MfSdkLvgIWaitKeyMs

Prototype	LIB_EXPORT s32 MfSdkLvgIWaitKeyMs(s32 timeoutMs)		
Function	waiting for key pressed		
Params	in	timeout	timeout(ms)
	out	Nothing	
return		>=0	success, key value or button id
		Other	fail
remark			
demo			

22.16 MfSdkLvgIClrKeyFlag

Prototype	LIB_EXPORT void MfSdkLvgIClrKeyFlag()				
Function	Clean the key flag bit before getting the key loop				
Params	in	Nothing			
	out	Nothing			
return	Nothing				
remark					
demo					

22.17 MfSdkLvgICheckKey

Prototype		LIB_EXPORT MFSDKBOOL MfSdkLvgICheckKey(void)	
Function		check if key pressed	
Params	in	Nothing	
	out	Nothing	
return	1	key pressed	
	0	no key pressed	
remark			
demo			

22.18 MfSdkLvgIGetKey

Prototype		LIB_EXPORT s32 MfSdkLvgIGetKey(void)	
Function		get key value	
Params	in	Nothing	
	out	Nothing	
return	>=0	Ref. MfSdkKbKeyCode_E	
	Other	fail	
remark			
demo			

22.19 MfSdkLvgIDispTextCoord

Prototype		LIB_EXPORT s32 MfSdkLvgIDispTextCoord(s32 x, s32 y, s32 font, s8* text)	
Function		disp text by coordinate	
Params	in	x	horizontal coordinate
		y	vertical coordinate

		font	0 - small,1 - normal,2 - big
		text	text
	out	Nothing	
return		0	success
		Other	fail
remark			
demo			

22.20 MfSdkLvglDispTextLine

Prototype	LIB_EXPORT s32 MfSdkLvglDispTextLine(s32 lineNo, s32 font, const s8* text, s32 align, u8 reverse)		
Function	disp text by line number		
Params	in	lineNo	line number(starting from 0)
		font	font(0 - small,1 - normal,2 - big)
		text	text
		align	align type(0 - left, 1 - center, 2 - right)
		reverse	reverse mode(1 - yes, 0 - no)
	out	Nothing	
return		0	success
		Other	fail
remark			
demo			

22.21 MfSdkLvglDispMenuText

Prototype	LIB_EXPORT s32 MfSdkLvglDispMenuText(s32 font, s8* title, MfSdkLvglMenuText_T menus[], s32 size, s32 select, s32 timeout)		
Function	disp text menus		
Params	in	font	font(0 - small,1 - normal,2 - big)
		title	title
		menus	menu list
		size	list size
		select	default menu id

		timeout	timeout(second)
	out	Nothing	
return		>=0	success, menu id
		Other	fail
remark			
demo			

22.22 MfSdkLvglDispMenulcon

Prototype	LIB_EXPORT s32 MfSdkLvglDispMenulcon(s32 font, s8* title, MfSdkLvglMenulcon_T menus[], s32 size, s32 timeout)		
Function	disp image menus		
Params	in	font	0 - small,1 - normal,2 - big
		title	title
		menus	menu list
		size	list size
		timeout	timeout(second)
	out	Nothing	
return		>=0	success, menu id
		Other	fail
remark			
demo			

22.23 MfSdkLvglDispButton

Prototype	LIB_EXPORT s32 MfSdkLvglDispButton(s32 lineNo, s32 font, MfSdkButtonIcon_T buttons[], s32 size, s32 timeout)		
Function	disp buttons		
Params	in	lineNo	line number(starting from 0)
		font	font(0 - small,1 - normal,2 - big)
		buttons	button list
		size	list size
		timeout	timeout(second)
	out	Nothing	

return	>=0	success, button id
	Other	fail
remark		
demo		

22.24 MfSdkLvgIMessageBox

Prototype		LIB_EXPORT s32 MfSdkLvgIMessageBox(s32 width, s32 height, s8* msg, s8* btnLeft, s8* btnRight, s32 timeout)		
Function		disp text menus		
Params	in	width	width	
		height	height	
		msg	message	
		btnLeft	left button text	
		btnRight	right button text	
		timeout	timeout(second)	
out		Nothing		
		return	>=0 success, button id (0 - left, 1 - right)	
			Other fail	
remark				
demo				

22.25 MfSdkLvgIDispList

Prototype		LIB_EXPORT s32 MfSdkLvgIDispList(s32 font, s8* title, s8* items[], s32 size, s32 timeout)	
Function		disp text list	
Params	in	font	font(0 - small,1 - normal,2 - big)
		title	title
		items	text list
		size	list size
		timeout	timeout(second)
		out	Nothing
return		0	success

	Other	fail
remark		
demo		

22.26 MfSdkLvgIDispRollpage

Prototype	LIB_EXPORT s32 MfSdkLvgIDispRollpage(s32 font, s8* title, s8* buf, s32 timeout)	
Function	disp text rollpage	
Params	in	font font(0 - small,1 - normal,2 - big)
		title title
		buf text buffer
		timeout timeout(second)
	out	Nothing
return	0	success
	Other	fail
remark		
demo		

22.27 MfSdkLvgIInputText

Prototype	LIB_EXPORT s32 MfSdkLvgIInputText(s32 font, s8* title, s8* msg, s8* text, s32 mode, s32 min, s32 max, s32 timeout)	
Function	input text, show input text on a line	
Params	in	font font(0 - small,1 - normal,2 - big)
		title title
		msg message
		mode 0 - number, 1 - text, 2 - IP, 3 - password, 4 - amount
		min mininum length
		max maximum length
		timeout timeout(second)
	out	text input text
return	0	success

	Other	fail
remark		
demo		

22.28 MfSdkLvgIInputTextEx

Prototype	LIB_EXPORT s32 MfSdkLvgIInputTextEx(s32 font, s8* title, s8* msg, s8* text, s32 mode, s32 min, s32 max, s32 timeout)	
Function	input text, show input text in a input box	
Params	in	font font(0 - small,1 - normal,2 - big)
		title title
		msg message
		mode 0 - number, 1 - text, 2 - IP, 3 - password, 4 - amount
		min minimum length
		max maximum length
		timeout timeout(second)
	out	text input text
return	0	success
	Other	fail
remark		
demo		

22.29 MfSdkLvgIDispBar

Prototype	LIB_EXPORT s32 MfSdkLvgIDispBar(s32 width, s32 height, s32 min, s32 max, void** bar)	
Function	disp progress bar	
Params	in	width width
		height height
		min minimum value
		max maximum value
	out	bar progress bar handle
return	0	success

	Other	fail
remark		
demo		

22.30 MfSdkLvglUpdateBar

Prototype	LIB_EXPORT s32 MfSdkLvglUpdateBar(void* bar, s32 value)	
Function	update progress bar	
Params	in	bar progress bar handle
		value current value
return	out	Nothing
		0 success
remark		Other fail
demo		

22.31 MfSdkLvglDispLed

Prototype	LIB_EXPORT s32 MfSdkLvglDispLed(s32 x, s32 y, s32 width, s32 height)	
Function	disp progress bar	
Params	in	x horizontal coordinate
		y vertical coordinate
return	in	width width
		height height
return	out	Nothing
		0 success
remark		Other fail
demo		

22.32 MfSdkLvgIUpdateLed

Prototype		LIB_EXPORT s32 MfSdkLvgIUpdateLed(s32 index, s32 state)		
Function		update led state		
Params	in	index	led index (0 - red, 1 - blue, 2 - green, 3 - yellow)	
		state	(0 - off, 1 - on)	
	out	Nothing		
return		0	success	
		Other	fail	
remark				
demo				

22.33 MfSdkLvgIShowQrcode

Prototype		LIB_EXPORT s32 MfSdkLvgIShowQrcode(s32 font, s8* title, s8* qrcode, s32 width, s32 align)		
Function		show qrcode		
Params	in	font	font(0 - small,1 - normal,2 - big)	
		title	title	
		qrcode	qrcode text	
		width	width	
		align	align type(0 - left, 1 - center, 2 - right)	
	out	Nothing		
return		0	success	
		Other	fail	
remark				
demo				

22.34 MfSdkLvgIShowQrcodeEx

Prototype		LIB_EXPORT s32 MfSdkLvgIShowQrcodeEx(s8* qrcode, s32 qrcodeLen, s32 width, s32 align, s32 y)		
Function		show qrcode		
Params	in	qrcode	qrcode data	
		qrcodeLen	qrcode data length	
		width	width	
		align	align type(0 - left, 1 - center, 2 - right)	
		y	Y offset	
return		0	success	
		Other	fail	
remark				
demo				

22.35 MfSdkLvgIShowImage

Prototype		LIB_EXPORT s32 MfSdkLvgIShowImage(s32 x, s32 y, s8* fileName, s8* text, s32 id)		
Function		show image button		
Params	in	x	horizontal coordinate	
		y	vertical coordinate	
		fileName	image file name	
		text	button text	
		id	button id(>=0 image with click event, <0 no click events)	
return		0	success	
		Other	fail	
remark				
demo				

22.36 MfSdkLvgIShowImageEx

Prototype		LIB_EXPORT s32 MfSdkLvgIShowImage(s32 x, s32 y, s32 align, s8* fileName, s8* text, s32 id)	
Function		show image button	
Params	in	x	horizontal coordinate
		y	vertical coordinate
		align	align type(0 - left, 1 - center, 2 - right)
		fileName	image file name
		text	button text
		id	button id(>=0 image with click event, <0 no click events)
	out	Nothing	
return		0	success
		Other	fail
remark			
demo			

22.37 MfSdkLvgIShowImagebuff

Prototype		LIB_EXPORT s32 MfSdkLvgIShowImagebuff(s32 x, s32 y, s32 w, s32 h, s8* buf, s8* text, s32 id)	
Function		show image buff	
Params	in	x	horizontal coordinate
		y	vertical coordinate
		w	width
		h	height
		buf	image buffer
		text	button text
		id	button id(>=0 image with click event, <0 no click events)
	out	Nothing	
return		0	success
		Other	fail

remark	
demo	

22.38 MfSdkLvgIShowScreenCanves

Prototype		LIB_EXPORT s32 MfSdkLvgIShowScreenCanves(s8* buf)	
Function		show except for the status bar the screen buff	
Params	in	buf	Screen buff(rgba 32-bit)
	out	Nothing	
return		0	success
		Other	fail
remark	MF960 with status bar,screen size is 480 * (800-30),buff size is 480 * (800-30) * 4;MF960 without status bar,screen size is 480 * 800,buff size is 480 * 800 * 4		
demo			

22.39 MfSdkLvgIDrawLine

Prototype		LIB_EXPORT s32 MfSdkLvgIDrawLine(s32 x, s32 y, s32 w, s32 h)	
Function		draw a line	
Params	in	x	horizontal coordinate
		y	vertical coordinate
		w	width
		h	height
return	out	Nothing	
		0	success
remark			
demo			

22.40 MfSdkLvgIDrawBox

Prototype		LIB_EXPORT s32 MfSdkLvgIDrawBox(s32 x, s32 y, s32 w, s32 h)		
Function		draw a box		
Params	in	x	horizontal coordinate	
		y	vertical coordinate	
		w	width	
		h	height	
out		Nothing		
return		0	success	
		Other	fail	
remark				
demo				

22.41 MfSdkLvgIEsign

Prototype		LIB_EXPORT s32 MfSdkLvgIEsign(s32 font, s8* title, s8* factor, u8 ** imgData, s32* dataSize, s32 timeout)		
Function		electronic signature		
Params	in	font	font(0 - small,1 - normal,2 - big)	
		title	title	
		factor	factor	
		timeout	timeout(second)	
out		imgData	image data	
		dataSize	image data size	
return		0	success	
		Other	fail	
remark				
demo				

22.42 MfSdkLvgIScan

Prototype		LIB_EXPORT s32 MfSdkLvgIScan(s32 font, s8* title, s8* data, s32 datasize, s32 timeout)		
Function		Scan the QR code, barcode		
Params	in	font	font(0 - small,1 - normal,2 - big)	
		title	title	
		dataSize	code data size	
		timeout	timeout(second)	
out		data	code data	
		0	success	
return		Other	fail	
remark				
demo				

22.43 MfSdkLvgIDispDialog

Prototype		LIB_EXPORT s32 MfSdkLvgIDispDialog(s32 font, s8* title, s8* msg, s32 timeout, u8 isCountDown, void** handle)	
Function		display dialog	
Params	in	font	font(0 - small,1 - normal,2 - big)
		title	title
		msg	message
		timeout	timeout(second)
		isCountDown	countdown mode (1 - Yes, 0 - No)
	out	handle	dialog handle
return		0	success
return		Other	fail
remark			
demo			

22.44 MfSdkLvgIUpdateDialog

Prototype		LIB_EXPORT s32 MfSdkLvgIUpdateDialog(void* handle, s8* title, s8* msg, s32 timeout, u8 isCountDown)	
Function		update dialog	
Params	in	handle	dialog handle
		title	title
		msg	message
		timeout	timeout(second)
		isCountDown	countdown mode (1 - Yes, 0 - No)
	out	Nothing	
return		0	success
		Other	fail
remark			
demo			

22.45 MfSdkLvgICloseDialog

Prototype		LIB_EXPORT s32 MfSdkLvgICloseDialog(void* handle)	
Function		close dialog	
Params	in	handle	dialog handle
	out	Nothing	
return		0	success
		Other	fail
remark			
demo			

22.46 MfSdkLvgIDispRollpageEx

Prototype	LIB_EXPORT s32 MfSdkLvgIDispRollpageEx(s32 font, s8* title, s8* buf, s32 timeout)
------------------	---

Function		display text rollpage	
Params	in	font	font(0 - small,1 - normal,2 - big)
		title	title
		buf	text buffer
		timeout	timeout(second)
	out	Nothing	
return	0	success	
	Other	fail	
remark			
demo			

22.47 MfSdkLvgIDispMultipleChoice

Prototype		LIB_EXPORT s32 MfSdkLvgIDispMultipleChoice(s32 font,const s8* title, MfSdkLvgIMenuText_T* choiseArry, s32 choiseSize, s32 select, s32 timeout)	
Function		display multiple choice	
Params	in	font	font(0 - small,1 - normal,2 - big)
		title	title
		choiseArry	list
		choiseSize	list size
		select	default list id
	out	timeout	timeout(second)
	out	Nothing	
return	>=0	success, list id	
	Other	fail	
remark			
demo			

22.48 MfSdkLvgIDispSetSlider

Prototype		LIB_EXPORT s32 MfSdkLvgIDispSetSlider(s8* title, s32 width, s32 height, s32 minLevel, s32 maxLevel, s32 startValue, s32 timeout)	
------------------	--	--	--

Function		set slider		
Params	in	title	title	
		width	slider width	
		height	slider height	
		minLevel	minimum slider value	
		maxLevel	maximum slider value	
		startValue	startValue slider initial value	
		timeout	timeout(second)	
out		Nothing		
return		0	success	
		Other	fail	
remark				
demo				

22.49 MfSdkLvgIDispSetResult

Prototype		LIB_EXPORT s32 MfSdkLvgIDispSetResult(s32 result, s8* msg, s32 timeout)	
Function		display set result	
Params	in	result	result
		msg	message
		timeout	timeout(second)
	out	Nothing	
return		0	success
		Other	fail
remark			
demo			

22.50 MfSdkLvgIInputPin

Prototype		LIB_EXPORT s32 MfSdkLvgIInputPin(s8* title, s8* msg, s8* amount, s8* cardID, s8* pin, s32 timeout)

Function		update dialog	
Params	in	title	title
		msg	message
		amount	amount
		cardID	cardID
		timeout	timeout(second)
	out	pin	input pin
return	0	success	
	Other	fail	
remark			
demo			

22.51 MfSdkLvgIDispAnimation

Prototype	LIB_EXPORT s32 MfSdkLvgIDispAnimation(s32 imgSize, s8** imgName, s8* msg, s32 interval, void** handle)		
Function	display animation		
Params	in	imgSize	images size
		imgName	images name
		msg	message
		interval	image display interval
	out	handle	animation handle
return	0	success	
	Other	fail	
remark			
demo			

22.52 MfSdkLvgICloseAnimation

Prototype	LIB_EXPORT s32 MfSdkLvgICloseAnimation(void* handle)
Function	close animation

Params	in	handle	animation handle
	out	Nothing	
return		0	success
		Other	fail
remark			
demo			

22.53 MfSdkLvgICreateStatusBarTask

Prototype	LIB_EXPORT void MfSdkLvgICreateStatusBarTask(MfSdkStatusBarCb task_cb)				
	set callback function for status bar task(The loop call callback once a second)				
Params	in	task_cb	callback function for status bar task(loop)		
	out	Nothing			
return	Nothing				
remark					
demo					

22.54 MfSdkLvgISetStatusBarIcon

Prototype	LIB_EXPORT s32 MfSdkLvgISetStatusBarIcon(s32 x, s8* iconname, s32 group)		
	display status bar icon		
Params	in	x	horizontal coordinate
		iconname	icon name
		group	icon group(max 5 groups, 0,1,2,3,4)
	out	Nothing	
return		0	success
		Other	fail
remark	This API can only be in MfSdkLvgICreateStatusBarTask callback function calls		
demo			

22.55MfSdkLvgIQuickSetStatusBarIcon

Prototype	LIB_EXPORT s32 MfSdkLvgIQuickSetStatusBarIcon(s32 x, s8* iconname, s32 group)	
Function	Quick display status bar icon	
Params	in	x horizontal coordinate
		iconname icon name
		group icon group(max 5 groups, 0,1,2,3,4)
	out	Nothing
return	0	success
	Other	fail
remark	This API is not in MfSdkLvgICreateStatusBarTask callback function calls	
demo		

22.56MfSdkLvgISetStatusBar

Prototype	LIB_EXPORT void MfSdkLvgISetStatusBar(s32 height, lv_color_t bgColor)	
Function	set status bar config	
Params	in	height status bar height
		bgColor status bar background color
	out	Nothing
	return	Nothing
remark		
demo		

22.57 MfSdkLvgIGetUiBuff

Prototype	LIB_EXPORT void MfSdkLvgIGetUiBuff(void (*getUI)(u8 *buf, s32 len))
------------------	---

Function		Get the LVGL refresh screen buff	
Params	in	getUI	The callback function for refreshing the screen
	out	Nothing	
return		Nothing	
remark			
demo			

22.58 MfSdkLvgILoadPng

Prototype		LIB_EXPORT s8 MfSdkLvgILoadPng(const s8 *filename)	
Function		Load png image	
Params	in	filename	png image path
	out	Nothing	
return		Ref.MfSdkLvgIOper_E	
remark			
demo			

22.59 MfSdkLvgIFreePng

Prototype		LIB_EXPORT s8 MfSdkLvgIFreePng(const s8 *filename)	
Function		Load png image	
Params	in	filename	png image path
	out	Nothing	
return		Ref.MfSdkLvgIOper_E	
remark			
demo			

22.60 MfSdkLvglGuilnit

Prototype		LIB_EXPORT void MfSdkLvglGuilnit(void)
Function		init LVGL group
Params	in	Nothing
	out	Nothing
return		Nothing
remark		
demo		

22.61 MfSdkLvglGroupSet

Prototype		LIB_EXPORT void MfSdkLvglGroupSet(iv_obj_t* obj)
Function		obj add to group and set focus obj
Params	in	obj
	out	Nothing
return		Nothing
remark		
demo		

23 Memory module

23.1 Module description

This module mainly includes APIs on memory operations.

23.2 Module structure declaration

None.

23.3 Constant declarations

None.

23.4 MfSdkMemFree

Prototype		LIB_EXPORT void MfSdkMemFree(void *ptr)
Function		ref. standard free
Params	in	ptr
	out	Nothing
return		Nothing
remark		
demo		

23.5 MfSdkMemMalloc

Prototype		LIB_EXPORT void *MfSdkMemMalloc(s32 size)
Function		Ref. standard malloc
Params	in	size
	out	Nothing
return		
remark		
demo		

23.6 MfSdkMemRealloc

Prototype		LIB_EXPORT void *MfSdkMemRealloc(void *ptr, s32 size)
Function		Ref. standard realloc
Params	in	ptr
		size
Params	out	Nothing
	return	

remark	
demo	

23.7 MfSdkMemCalloc

Prototype		LIB_EXPORT void *MfSdkMemCalloc(s32 nitems, s32 size)
Function		
Params	in	nitems
		size
	out	Nothing
return		
remark		
demo		

24 Base module

24.1 Module description

Base device.

24.2 Module structure declaration

None.

24.3 Constant declarations

None.

24.4 MfSdkBaseCheck

Prototype		s32 MfSdkBaseCheck()
Function		Whether the device uses a base
Params	in	Nothing
	out	Nothing

return	0	Not base
	1	have base
remark		
demo	<pre>s32 ret = 0; ret = MfSdkBaseCheck(); if(ret==1) { //have base }</pre>	