

ZKFinger SDK Development Guide

C API

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Release History

Date	Version	Remarks
May 21, 2016	1.0	Basic version
June 1, 2016	1.1	Added external image interfaces.
Sep 18, 2016	2.0	Added 2.0 interface, keep old interface

Contents

1 Overview	4
2 Privacy Policy	4
3 System Requirements.....	4
4 Installation and Deployment	4
5 Description of SDK Interfaces	4
5.1 Type Definition.....	4
5.1.1 Constants	4
5.2 Interface Description	5
5.2.1 ZKFPM_Init.....	5
5.2.2 ZKFPM_Terminate	5
5.2.3 ZKFPM_GetDeviceCount	5
5.2.4 ZKFPM_OpenDevice	6
5.2.5 ZKFPM_CloseDevice	6
5.2.6 ZKFPM_SetParameters.....	6
5.2.7 ZKFPM_GetParameters.....	7
5.2.8 ZKFPM_AcquireFingerprint.....	7
5.2.9 ZKFPM_AcquireFingerprintImage	8
5.2.10 ZKFPM_DBInit.....	8
5.2.11 ZKFPM_DBFree	9
5.2.12 ZKFPM_DBMerge	9
5.2.13 ZKFPM_DBAdd.....	10
5.2.14 ZKFPM_DBDel.....	10
5.2.15 ZKFPM_DBClear.....	10
5.2.16 ZKFPM_DBCount.....	11
5.2.17 ZKFPM_DBIdentify	11
5.2.18 ZKFPM_DBMatch	12
5.2.19 ZKFPM_ExtractFromImage	12
6 Appendixes	13
6.1 Appendix 1	13
6.2 Appendix 2.....	14



1 Overview

Thank you for using ZKFinger SDK. Please read this document carefully before use to fast learn how to use ZKFinger SDK.

2 Privacy Policy

You are authorized to use the software but you must make the following commitment to ZKTeco: You shall not use, copy, modify, lease, or transfer any part of the SDK beyond the clauses of this document.

3 System Requirements

- 1) Operating system: Ubuntu
- 2) Applicable development languages: C,C++

4 Installation and Deployment

- 1) Copy all the library files from lib-x86/lib-x64 to /usr/lib.

5 Description of SDK Interfaces

5.1 Type Definition

See *libzkfp_type.h*.

The SDK interfaces uses `__stdcall`.

```
#ifdef _WIN32
#ifdef APICALL
#define APICALL __stdcall
#endif
```

5.1.1 Constants

- 1) Maximum length of a template
[Definition] `#define MAX_TEMPLATE_SIZE 2048`

- 2) Fingerprint 1:1 threshold parameter code
[Definition] `#define FP_THRESHOLD_CODE` 1
- 3) Fingerprint 1:N threshold parameter code
[Definition] `#define FP_MTHRESHOLD_CODE` 2

5.2 Interface Description

5.2.1 ZKFPM_Init

[Function]

`int` APICALL ZKFPM_Init();

[Purpose]

This function is used to initialize resources.

[Parameter Description]

None

[Return Value]

0 Succeeded

Others Failed (See the Appendixes.)

5.2.2 ZKFPM_Terminate

[Function]

`int` APICALL ZKFPM_Terminate();

[Purpose]

This function is used to release resources.

[Parameter Description]

None

[Return Value]

0 Succeeded

Others Failed (See the Appendixes.)

5.2.3 ZKFPM_GetDeviceCount

[Function]

`int` APICALL ZKFPM_GetDeviceCount();

[Purpose]

This function is used to acquire the number of devices.

[Parameter Description]

None

[Return Value]

≥ 0 Device count



<0 The function fails to be called (See the Appendixes.)

5.2.4 ZKFPM_OpenDevice

[Function]

HANDLE APICALL ZKFPM_OpenDevice([int](#) index);

[Purpose]

This function is used to start a device.

[Parameter Description]

index

Device index

[Return Value]

Device operation instance handle

5.2.5 ZKFPM_CloseDevice

[Function]

[int](#) APICALL ZKFPM_CloseDevice(HANDLE hDevice);

[Purpose]

This function is used to shut down a device.

[Parameter Description]

hDevice

Device operation instance handle

[Return Value]

0 Succeeded

Others Failed (See the Appendixes.)

5.2.6 ZKFPM_SetParameters

[Function]

[int](#) APICALL ZKFPM_SetParameters(HANDLE hDevice, [int](#) nParamCode, [unsigned char](#)* paramValue, [unsigned int](#) cbParamValue);

[Purpose]

This function is used to set fingerprint reader parameters.

[Parameter Description]

hDevice

Device operation instance handle

nParamCode

Parameter code (For details, see the parameter code list.)

paramValue

Parameter value

cbParamValue



Parameter data length

[Return Value]

0 Succeeded

Others Failed (See the Appendixes.)

[Note]

5.2.7 ZKFPM_GetParameters

[Function]

```
int APICALL ZKFPM_GetParameters(HANDLE hDevice, int nParamCode, unsigned char* paramValue, unsigned int* cbParamValue);
```

[Purpose]

This function is used to acquire fingerprint reader parameters.

[Parameter Description]

hDevice

Device operation instance handle

nParamCode

Parameter code (For details, see the parameter code list.)

paramValue [out]

Returned parameter value

cbParamValue [in/out]

[in] Memory size allocated based on nParamCode

[out] Data size of the returned parameter value

[Return Value]

0 Succeeded

Others Failed (See the Appendixes.)

[Note]

5.2.8 ZKFPM_AcquireFingerprint

[Function]

```
int APICALL ZKFPM_AcquireFingerprint(HANDLE hDevice, unsigned char* fpImage, unsigned int cbFPImage, unsigned char* fpTemplate, unsigned int* cbTemplate);
```

[Purpose]

This function is used to capture a template.

[Parameter Description]

hDevice

Device operation instance handle

fpImage [out]

Returned fingerprint image

cbFPImage

Memory size of **fpImage**

fpTemplate [out]
Returned fingerprint template

cbfpTemplate [in/out]
[in] Pre-allocated memory size of **fpTemplate**. It is recommended that it be set to **MAX_TEMPLATE_SIZE(2048)**.
[out] Fingerprint template data size that is **actually** returned

[Return Value]
0 Succeeded
Others Failed (See the Appendixes.)

[Note]

5.2.9 ZKFPM_AcquireFingerprintImage

[Function]
`int APICALL ZKFPM_AcquireFingerprintImage(HANDLE hDevice, unsigned char* fpImage, unsigned int cbFPImage);`

[Purpose]
This function is used to capture a image.

[Parameter Description]
hDevice
Device operation instance handle
fpImage [out]
Returned fingerprint image
cbFPImage
Memory size of **fpImage**

[Return Value]
0 Succeeded
Others Failed (See the Appendixes.)

[Note]

5.2.10 ZKFPM_DBInit

[Function]
`HANDLE APICALL ZKFPM_DBInit();`

[Purpose]
This function is used to create an algorithm cache.

[Parameter Description]
None

[Return Value]
Cache handle

5.2.11 ZKFPM_DBFree

[Function]

`int` APICALL ZKFPM_DBFree(HANDLE hDBCach);

[Purpose]

This function is used to release an algorithm cache.

[Parameter Description]

Cache handle

[Return Value]

0 Succeeded

Others Failed (See the Appendixes.)

5.2.12 ZKFPM_DBMerge

[Function]

`int` APICALL ZKFPM_DBMerge(HANDLE hDBCach, `unsigned char*` temp1, `unsigned char*` temp2, `unsigned char*` temp3, `unsigned char*` regTemp, `unsigned int*` cbRegTemp);

[Purpose]

This function is used to combine three pre-registered fingerprint templates as one registered fingerprint template.

[Parameter Description]

hDBCach

Cache handle

temp1

Pre-registered fingerprint template 1

temp2

Pre-registered fingerprint template 2

temp3

Pre-registered fingerprint template 3

regTemp[out]

Registered template

cbRegTemp[in/out]

[in] Pre-allocated memory size of **fpTemplate**. It is recommended that it be set to **MAX_TEMPLATE_SIZE(2048)**.

[out] Fingerprint template data size that is actually returned

[Return Value]

0 Succeeded

Others Failed (See the Appendixes.)

5.2.13 ZKFPM_DBAdd

[Function]

`int` APICALL ZKFPM_DBAdd(HANDLE hDBCache, `unsigned int` fid, `unsigned char*` fpTemplate, `unsigned int` cbTemplate);

[Purpose]

This function is used to add a registered fingerprint template to the cache.

[Parameter Description]

hDBCache

Cache handle

fid

Fingerprint ID (32-bit unsigned integer larger than 0)

fpTemplate

Registered template

cbTemplate

Template length

[Return Value]

0 Succeeded

Others Failed (See the Appendixes.)

5.2.14 ZKFPM_DBDel

[Function]

`int` APICALL ZKFPM_DBDel(HANDLE hDBCache, `unsigned int` fid);

[Purpose]

This function is used to delete the registered template of a specified fingerprint ID from the cache.

[Parameter Description]

hDBCache

Cache handle

fid

Fingerprint ID

[Return Value]

0 Succeeded

Others Failed (See the Appendixes.)

5.2.15 ZKFPM_DBClear

[Function]

`int` APICALL ZKFPM_DBClear(HANDLE hDBCache);

[Purpose]

This function is used to clear the cache.

[Parameter Description]

hDBCACHE
Cache handle

[Return Value]

0 Succeeded
Others Failed (See the Appendixes.)

5.2.16 ZKFPM_DBCount

[Function]

int APICALL ZKFPM_DBCount(HANDLE hDBCACHE, **unsigned int*** fpCount);

[Purpose]

This function is used to acquire the number of fingerprint template in the cache.

[Parameter Description]

hDBCACHE
Cache handle
fpCount [out]
Fingerprint image account

[Return Value]

0 Succeeded
Others Failed (See the Appendixes.)

[Note]

5.2.17 ZKFPM_DBIdentify

[Function]

int APICALL ZKFPM_DBIdentify(HANDLE hDBCACHE, **unsigned char*** fpTemplate, **unsigned int** cbTemplate, **unsigned int*** FID, **unsigned int*** score);

[Purpose]

This function is used to conduct 1:N comparison.

[Parameter Description]

hDBCACHE
Cache handle
fpTemplate
Fingerprint template
cbTemplate
Data length of the fingerprint template
FID [out]
Returned fingerprint ID
Score [out]
Returned comparison score

[Return Value]

0 Succeeded
Others Failed (See the Appendixes.)

5.2.18 ZKFPM_DBMatch

[Function]

int APICALL ZKFPM_DBMatch (HANDLE hDBCache, **unsigned char*** fpTemplate1, **unsigned int** cbfpTemplate1, **unsigned char*** fpTemplate2, **unsigned int** cbfpTemplate2);

[Purpose]

This function is used compare whether two fingerprint templates match.

[Parameter Description]

hDBCache
 Cache handle
fpTemplate1
 Fingerprint template 1
cbfpTemplate1
 Data length of fingerprint template 1
fpTemplate2
 Fingerprint template 2
cbfpTemplate2
 Data length of fingerprint template 2

[Return Value]

>=0 Comparison score
<0 Error (See the Appendixes.)

5.2.19 ZKFPM_ExtractFromImage

[Function]

ZKINTERFACE **int** APICALL ZKFPM_ExtractFromImage(HANDLE hDBCache, **const char*** lpFilePathName, **unsigned int** DPI, **unsigned char*** fpTemplate, **unsigned int** *cbTemplate);

[Purpose]

This function is used to extract a fingerprint template from a BMP or JPG file.

[Parameter Description]

hDBCache
 Cache handle
lpFilePathName
 Full path of a file
DPI
 Image DPI
fpTemplate
 Fingerprint template
cbfpTemplate

Data length of fingerprint template 1

[Return Value]

0 Succeeded

Others Failed (See the Appendixes.)

[Note]

Only the SDK of the standard version supports this function.

6 Appendixes

6.1 Appendix 1

List of Common Parameter Codes

Parameter Code	Property	Data Type	Description
1	Read-only	Int	Image width
2	Read-only	Int	Image height
3	Read-write (supported only by the LIVEID20R currently)	Int	Image DPI (750/1000 is recommended for children.)
106	Read-only	Int	Image data size
1015	Read-only	4-byte array	VID&PID (The former two bytes indicate VID and the latter two bytes indicate PID.)
2002	Read-write (supported only by the LIVEID20R currently)	Int	Anti-fake function (1: enable; 0: disable)
2004	Read-only	Int	A fingerprint image is true if the lower five bits are all 1's (value&31==31).
1101	Read-only	String	Vendor information
1102	Read-only	String	Product name
1103	Read-only	String	Device SN
101	Write-only (Devices except the LIVE20R need to call a function to disable the parameter.)	Int	1 indicates that the white light blinks; 0 indicates that the parameter is disabled.
102	Write-only (Devices	Int	1 indicates that the

Parameter Code	Property	Data Type	Description
	except the LIVE20R need to call a function to disable the parameter.)		green light blinks; 0 indicates that the parameter is disabled.
103	Write-only (Devices except the LIVE20R need to call a function to disable the parameter.)	Int	1 indicates that the red light blinks; 0 indicates that the parameter is disabled.
104	Write-only (not supported by the LIVE20R)	Int	1 indicates that buzzing is started; 0 indicates that the parameter is disabled.
10001	Write-only(only supported by ISO/ANSI Version)	Int	0 ANSI378; 1 ISO 19794-2

6.2 Appendix 2

Descriptions of Returned Error Values

0	Operation succeeded
1	Initialized
-1	Failed to initialize the algorithm library
-2	Failed to initialize the capture library
-3	No device connected
-4	Not supported by the interface
-5	Invalid parameter
-6	Failed to start the device
-7	Invalid handle
-8	Failed to capture the image
-9	Failed to extract the fingerprint template
-10	Suspension operation
-11	Insufficient memory
-12	The fingerprint is being captured (the device is busy)
-13	Failed to add the fingerprint template to the memory
-14	Failed to delete the fingerprint template
-17	Operation failed (other error)
-18	Capture cancelled
-20	Fingerprint comparison failed (Great differences are incurred when different fingers are pressed or fingers are pressed improperly during registration.)
-22	Failed to combine registered fingerprint templates
-23	Opening the file failed

-24	Image processing failed
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