ZKFinger Reader SDK Development Guide C API

Version: 2.0

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ZKFinger Reader SDK Development Guide

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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

Thank you for using ZKFinger Reader SDK. Please read this document carefully before use to fast learn how to use ZKFinger Reader 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: Windows XP or a later version
2) Applicable development languages: C++, C#, VB, Delphi

4 Installation and Deployment

1) Installation: Install ZKFinger SDK 5.x/ZKOnline SDK 5.x.

5 Description of SDK Interfaces

5.1 Type Definition

See *libzkfptype.h.*
The SDK interfaces uses __stdcall.
```
#ifdef _WIN32
#ifndef 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 hDBCache);

[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 hDBCache, 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]

    hDBCache

        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

    cbfpTemplate

        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