Windows Player SDK
Programmer Manual

(For Windows 7/XP/2000/2003/Vista 32 bit)

Version 6.3.XX

2012-02

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Chapter 1 Product Description

The Player SDK (hereby referred to as “The SDK” or “The player SDK”) is the secondary development kit for the decoding of HIKVISION DVR, DVS and IP devices, etc. The SDK supports video/ audio decoding from all the devices listed below:

DS-95xx/96xx series and DS-76xx series NVR;

DS-90xx series and DS-76xx series hybrid DVR;

DS-91xx series, DS-81xx/71xx/72xx series, DS-80xx/70xx series, DS-73xx series DVR; ATM DVR and mobile DVR;

DS-60xx series, DS-61xx series, DS-63xx series, DS-64xx series, DS-65xx series and DS-66xx series DVS, Decoder and Encoder;

DS-40xx/41xx/42xx series compression card;

IP devices: IP module, IP camera and IP Speed Dome, etc

The main functions of the Player SDK include real time live view of video stream, playback of recording files with control functions such as pause, step forward, step backward, etc; and the SDK can also get stream information such as file index, decoding frame info, resolution and frame rate, etc. The SDK also supports snapshot in BMP or JPG format.

Chapter 2 Version Update

Version Description

The naming rules of Player SDK version is described as following.

***V** Main version. Sub Version. Fix Version. Reserved Version*

- ***Main version update**:* large-scale modification, re-construction or optimization of the SDK
- ***Sub version update:*** Additional functions/features added to the SDK
- ***Fix version update:*** partial changes or bug-fixing of the SDK
- ***Reserved version:*** reserved

Special Notice: If your CPU supports Hyper-Threading Technology, please use V3.4 or higher version of the SDK.

Version 6.3.0.0

Update:

1. Fix display bugs
2. Programmer manual updating: Add description of several APIs which had been listed on the header file yet not on the previous documents.

Addition:

1. Add APIs for reverse playback:
   PlayM4_ReversePlay()
   PlayM4_GetSystemTime()
   PlayM4_SetPlayedTimeEx()

Version 6.2.2.3

Update:

1. Fix the bug of registering decoding callback crashes for some devices with watermark function
2. Fix the audio bug under RTP, fast forward mode
3. Optimize the real time performance of live stream

Addition:

1. Support multi-reference-frame decoding of standard H.264

Version 6.2.1.1

Update:

1. Fix display bugs

Addition:

2. Support video stream from DS-65xx and DS-66xx series DVS
3. Support video stream from DS-91xx-ST series DVR

Version 6.1.1.21

Update:

1. Fix the application exception problem when closing service of certain types of display adapter under Win7 OS;
2. Fix the error of single-frame functions invalid under playback pause mode;
3. Fix the playback speed abnormal error under throw B frame mode

Addition:

4. Support multiple watermark encryption types;
5. Support new version watermark

Version 6.1.1.17

Special Notice for Version 6.1.1.17

This new version SDK is thread-safe, and users do not need to consider about multi-thread safety issues anymore during developing. However, some of the API calling method in the previous version may cause application hanging problems, i.e. call API directly in callback function.

Update:

1. Fix the snapshot function under throw B frame mode;
2. Support longer file path;
3. Fix the playback frame index error under step forward/backward mode;
4. Decrease the time delay of live view;
5. Fix the time stamp of audio decoding playback

Addition:

1. Support pure audio stream/ audio file playback
2. Support new version watermark;

Version 6.1.1.12

Update:

1. Extend the application of API PlayM4_AdjustWaveAudio
2. Fix the return value for PlayM4_GetSrcRemainData
3. Fix the bug of no display after some screen-saver activated
4. Support up to 32 display device for multi-display requirements
5. Fix the memory leak problem of 2CIF Jpeg

Addition:

1. Add API PlayM4_SkipErrorData and PlayM4_CheckDiscontinuousFrameNum
2. Add protect mechanism to prevent message/callback registration at the same time

Version 6.1.1.8

Update:

1. Correct the GetNextKeyFramePos failure problem;
2. Optimize the display effect of the video from 8100 series DVR and 4200 card;
3. Correct the video decoding callback data error after calling relative APIs to set the display position;
4. Does not support pure audio stream playback.

Version 6.1.1.7

Update:

1. Correct the getting total video file duration error for DS-9000 series DVR;

Addition:

1. Support AMR audio;
2. Support PCM-L16 audio.

Version 6.1.1.6

Update:

1. Optimize the 4CIF decoding efficiency;
2. Modified the audio/video decoding callback, and make it consistent with V4.9

Addition:

1. Support video/audio from DS-65xx series;

Version 6.1.1.5

Update:

1. Correct the return value error of GetSourceBufferRemain;
2. Fix the step forward failure.

Version 6.1.1.3

Update:

1. Correct the no display problem after locking screen;

Addition:

1. Support MJPEG video playback;
2. Support G726 audio playback.

V 6.1.1.0

Addition:

1. Self-Adaptive to multi-screen display

2. Support decoding of KY2009 video format.
3. Functions of PlayM4_GetFileSpecialAttr (), PlayM4_GetOriginalFrameCallBack () are no longer supported, these functions can be realized in other separated libraries.

V6.0.0.1

Addition:

1. Support DS-9000 Series device
2. Support up to 500 channel decoding instead of the previous 100 channel decoding

V5.0

Addition:

1. All the decoding modules are separated independently in dll format, and load dynamically during the decoding process if needed.

V4.9

Addition:

1. Add 2 APIs PlayM4_GetPort() and PlayM4_FreePort(), which are used to get the free player port number and release the port number already occupied.
2. Add callback function PlayM4_SetFileEndCallback () to get file decode end information.

V4.8 (Build 2007-08-13)

Addition:

1. Provide API PlayM4_GetBMP () and PlayM4_GetJPEG () to fix the bug of can not capture images on pause mode, and these 2 APIs can be called whenever during playback.
2. Provide API on frame loss occasion to judge whether jump to the next I frame when frame number is not continuous, and the default mode is to jump to the next frame.
3. Provide API PlayM4_SetDecCallBackMend (), which enables user-define parameters.

V4.7 (Build 2006-07-11)

Addition:

1. Provide API PlayM4_SetJpegQuality () to set the quality of the jpeg file.
2. Provide API PlayM4_ConvertToJpegFile () to convert the yuv image to a jpeg file.
3. Provide API PlayM4_SetDeflash () to set deflash of key frame.
4. Provide API PlayM4_InputFileHead to input file header before the file is opened;

V4.6 (Build 2005-08-08)

Update:

1. Optimize the decode of player SDK, decrease the CPU usage it takes.

V4.5 (Build 2005-03-03)

Addition:

1. Provide API PlayM4_GetOriginalFrameCallBack () and PlayM4_GetFileSpecialAttr() to combine files.

Update:

1. Update the decoding lib to match version3.2 HCI board encoding. Be compatible with old version.

Notice: Old version player SDK can not playback the encoded data of HCI board using version3.2 above system SDK.

V4.3 (Build 2004-09-10)

Addition:

1. Add an info function to inform the user if the image format is changed when in encoding.

Update:

1. The original callback function to inform the user if the image format is changed when in encoding is sheltering.
2. The defaulted adjusting video parameter interface will not be opened, efficiently save the resources of CPU.

V4.3 (Build 2004-09-01)

Addition:

1. Add a callback function to inform the user if the image format is changed during encoding, and users can change the size of the image interface.
2. Add APIs to get/adjust video parameters, and therefore users can change video parameters like the brightness, contrast, saturation, and hue during playback, and get a better playback performance.
3. Add a function that is to transform the decoded YUV data directly to AVI format files in the DEMO of the player. Please pay attention: at present we can only process the video data, and the transformed AVI files will occupy large rooms of the disk, one second data will need 3.6M. The files needed to be transformed cannot exceed 500 seconds, and it need to install version DivX5.2 Activex to playback the transformed files.

V4.3 (Build 2004-06-26)

Update:

1. Modify the problem possibly happened when using the network client-end to show the picture
2. Modify the BUG possibly happened when using the length to index the files in the last

version.

V4.2 (Build 0616)

Update:

1. Support the dynamic change of the image format, for example: from 4CIF to CIF, the player will self recognized, need not to reboot the player.
2. Modify PlayM4_SetVerifyCallBack function, which can check whether the frame or data is lost in the file.

V4.0 (Build 0420)

Update:

1. Support 4CIF picture format decode.

V3.6 (Build 1230)

Update:

1. Support picture format changed on stream. Example, from CIF to QCIF, needn't restart.

Addition:

1. Adjust wave data.
2. Verify the data.
3. Refer to the wave data through a callback function.

V3.4 (Build 0626)

Update:

1. Support more than 16 ports, the port is now from 0 to 99;

Addition:

1. Set/Get the timer that the player sdk using.
2. Clear the buffer/Get the buffer remain value.

V3.2 (Build 0430)

Addition:

1. Split audio and video stream to input
2. When using off-screen, you can get the surface DC. And then you cound draw on the surface. If you use overlay surface, you needn't this DC, becase you can draw on the window directly.
3. Get and set file index information.

V3.0 (Build 0328)

Addition:

1. Support date stream generated from DS-400XH series card
2. Can set up to 4 display regions and support part-region display (can realize part-region enlargement) (68-70)
3. Can set stream type of decode CALLBACK (67)

Modification:

1. Correct BUG that is originally called I frame back only (please refer to PlayM4_SetDecCallBack).

V2.5 (Build 1118)

Modification:

1. Fix the bug of PlayM4_OpenStream occasionally fails with error value PLAYM4_SYS_NOT_SUPPORT.

V2.5 (Build 1115)

Addition:

1. Set display type

Modification:

1. Modify some bugs

V2.4 (Build 0911)

Addition:

1. Some functions to get more information;
2. Some functions to control source buffer in stream mode;
3. Some functions to control render buffer ;
4. Some functions to locate the file. And play step back ;
5. A function to throw B frames ;
6. Some functions to support Multiple-Monitor Systems ;

Modification:

1. The efficiency of the player is improved greatly, and at the same time it can play 9 files (Pentinum4 1.5GHZ), and it can play more if the video is simple. Notice: The display hardware must supports arbitrary shrinking and stretching of a surface along the x-axis (horizontally) and the y-axis (vertically) for blit operations.

2. Don’t exit the decode thread when the file which is playing come to the end.
3. The current time and frame number witch is got through the functions don’t reference to the state of decoding, but reference to the state of playing.
4. Extend the range of playing speed.
5. Correct the BMP snapshot error when the video adapter doesn’t support shrinking and stretching

V2.2 (Build 0703)

Addition:

1. Getting error codes	PlayM4_GetLastError ;
2. Refreshing display windows	PlayM4_RefreshPlay ;
3. Getting the size of image	PlayM4_GetPictureSize ;
4. Using OVERLAY surface to display	PlayM4_SetOverlayMode ;
5. Setting image quality	PlayM4_SetPicQuality ;
6. Opening sound in share mode	PlayM4_PlaySoundShare ;
7. Closing sound in share mode	PlayM4_StopSoundShare ;

Modification:

1. Can play step when it is pausing.
2. Support the operations such as pause, fast, , slow and step in STREAM_FILE mode.
3. Support shrinking and stretching with software method when the display hardware doesn't support it.
4. Correct the playback speed when the video stream is not normal (25 frames per second in PAL).

V2.0 (Build 0607)

Modification:

1. Improved the image quality.
2. Improve the playing performance.

V2.0 (Build 0605)

Addition:

1. Capture picture.
2. Support the user to display audio and video themselves
3. Can set stream mode (the real time mode and the file mode).
4. Get the current time of playing (millisecond).
5. Locate file by time.
6. Getting the total frames of the file and the number of frame which is currently decoding.
7. Getting the current display rate.
8. Get the current version information.
9. Support QCIF format.

V1.11

1. Correct the problem that the player causes the computer freeze.

V1.1

Addition:

1. Support multi channel playback (The performance is related to the PC hardware

configuration. Now it can playback 4 channels at the same time in Pentinum4 1.5GHz).

2. Support stream input mode;

Notice: CPU must be Intel Pentinum3 or above; The users do not need to initialize and release DiretDraw surface;

V1.0

The player only support one channel playback, and the input parameter of nPort must be 0, but we will support multi-channel Playback in future. Because the video display requires some capabilities of the video adapter, therefore it is suggested to follow these operation steps if there is problems during display: 1) Set the color quality as 32bit; 2) Replace video adapter.

Chapter 3 Error Code Definition

ID	Code	Description
PLAYM4_NOERROR	0	No error
PLAYM4_PARA_OVER	1	Illegal input parameter
PLAYM4_ORDER_ERROR	2	Calling reference error
PLAYM4_TIMER_ERROR	3	Set timer failure
PLAYM4_DEC_VIDEO_ERROR	4	Video decoding failure
PLAYM4_DEC_AUDIO_ERROR	5	Audio decoding failure
PLAYM4_ALLOC_MEMORY_ERROR	6	Memory allocation failure
PLAYM4_OPEN_FILE_ERROR	7	File operation failure
PLAYM4_CREATE_OBJ_ERROR	8	Create thread failure
PLAYM4_CREATE_DDRAW_ERROR	9	Create directDraw failure
PLAYM4_CREATE_OFFSCREEN_ERROR	10	Create offscreen failure
PLAYM4_BUF_OVER	11	Buffer overflow, input stream failure
PLAYM4_CREATE_SOUND_ERROR	12	Create sound device failure
PLAYM4_SET_VOLUME_ERROR	13	Set volume failure
PLAYM4_SUPPORT_FILE_ONLY	14	This API can only be called in file decoding mode
PLAYM4_SUPPORT_STREAM_ONLY	15	This API can only be called in stream decoding mode
PLAYM4_SYS_NOT_SUPPORT	16	System not support, the SDK can only work with CPU above Pentium 3
PLAYM4_FILEHEADER_UNKNOWN	17	Missing file header
PLAYM4_VERSION_INCORRECT	18	Version mismatch between encoder and decoder
PALYM4_INIT_DECODER_ERROR	19	Initialize decoder failure
PLAYM4_CHECK_FILE_ERROR	20	File too short or unrecognizable stream
PLAYM4_INIT_TIMER_ERROR	21	Initialize timer failure
PLAYM4_BLT_ERROR	22	BLT failure
PLAYM4_UPDATE_ERROR	23	Update overlay surface failure
PLAYM4_OPEN_FILE_ERROR_MULTI	24	Open video & audio stream failure
PLAYM4_OPEN_FILE_ERROR_VIDEO	25	Open video stream failure
PLAYM4_JPEG_COMPRESS_ERROR	26	JPEG compression failure
PLAYM4_EXTRACT_NOT_SUPPORT	27	File type not supported
PLAYM4_EXTRACT_DATA_ERROR	28	Data error
PLAYM4_SECRET_KEY_ERROR	29	Secret key error
PLAYM4_DECODE_KEYFRAME_ERROR	30	Key frame decoding failure
PLAYM4_NEED_MORE_DATA	31	Not enough data
PLAYM4_INVALID_PORT	32	Invalid port number
PLAYM4_NOT_FIND	33	Searching failed

Chapter 4 Display Description

The display part of the player mainly adopts DirectDraw technology. There are 2 ways to achieve video display:

1. Create off screen image with BLT.
2. Create OVERLAY surface.

The characters of these two methods are:

1. For the Off screen display mode, the merits are: each channel of the Multi-channel playback can be relatively independent and not influenced by each other. Shortcomings: the display performance is greatly affected by the display adapter. If the display adapter does not support zoom operation, the player will zoom via software if needed (while the display window and the original image size are different), which will cause high CPU usage. Therefore we provide an interface PlayM4_ GetCaps to test the display adapter's capability. Users can test with their display adapters to see if it supports BLT zooming, etc. Form 1 is a display adapter that we tested;
2. For the OVERLAY display mode, the merits are: Most display adapters support OVERLAY mode, and the OVERLAY mode supports hardware zooming. If the display adapter does not support off screen with zooming, then we can use overlay mode. Shortcoming: There can be only one OVERLAY surface for each display adapter, and thus only 1 channel display can use OVERLAY mode. If there is other program that occupies the OVERLAY surface, the player cannot use OVERLAY then; and if the OVERLAY surface is occupied by the player, the other programs cannot display in overlay mode, either.

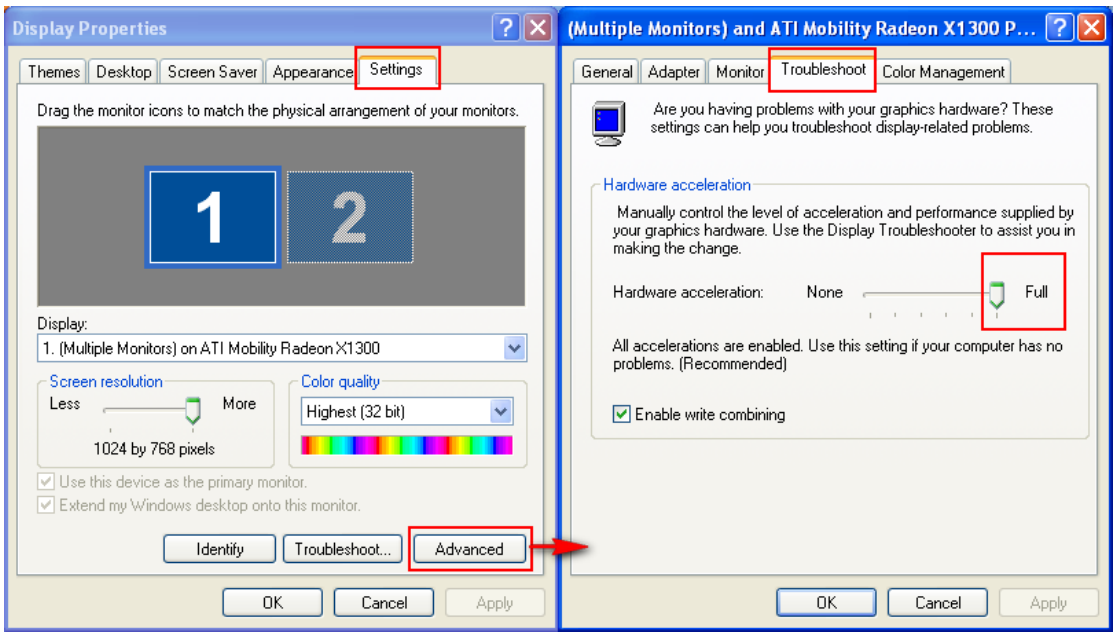
For the Windows 2003 OS users, please kindly Notice:

The Server Operating System such as Windows 2003 is not developed for multimedia display functions, and thus some of the video handling functions (i.e. hardware acceleration, directX) are disabled by default and need to be enabled manually.

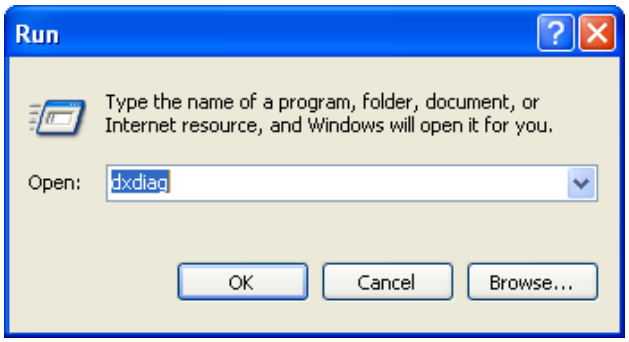
As most of the display functions in the SDK is depended on the BLT function of the display adapter (image zooming via hardware, when the original image size is not consistent with the display image size, we'll need this feature on the display adapter), if the display adapter (or its driver) does not support this feature, the SDK will switch to software zooming mode, and then the CPU usage will increase accordingly.

For Windows 2003 OS, please kindly follow the below operation steps:

1. Right click on Windows Desktop-> Select "Properties" ->Settings-> Advanced-> Troubleshoot->and drag "Hardware Acceleration" to "Full".



2. Click “Start”-> “Run” of Windows task bar, input “dxdiag” and enter DirectX diagnosing program.



3. Enable “DirectDraw” and “Direct3D” options in the “Display” column.

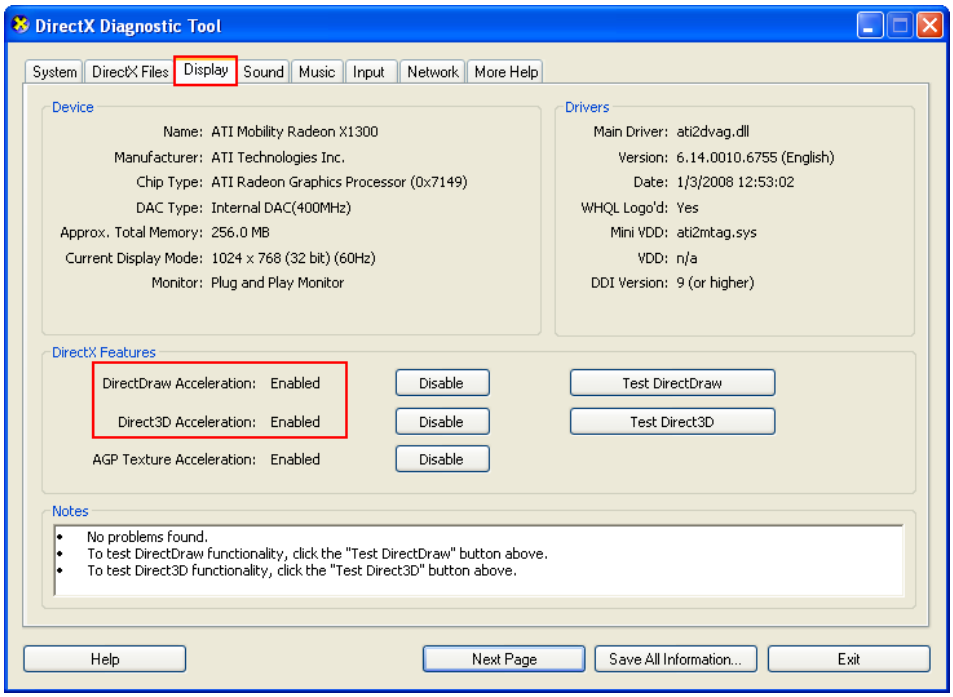


Table 1: These are some video adapter models which have been already tested (Windows2000)

Display Adapter Model	Memory (M)	Support Color Convertion	Support shrink	Support Stretch
ATI Rage128	32	YES	YES	YES
ATI Radeon LE	32	YES	YES	YES
ATI Radeon 7200	64	YES	YES	YES
nVidia TNT2 Model64	16 & 32	YES	YES	YES
nVidia TNT2 Pro	32	YES	YES	YES
Geforce2 Mx, Mx200, Mx400	32	YES	YES	YES
Geforce4 Mx420, Mx440	32	YES	YES	YES
**********				
Sis630	16	NO	NO	NO
Sis305	32	YES	NO	NO

Notice:

For the nVidia display adapters, users may need to update the driver to the latest version, otherwise some function may not be supported. If you find other display adapters cannot support some display functions, it is suggested to update the driver and test again.

Chapter 5 API Calling Reference

Initialize application

File Mode

PlayM4_GetPort
PlayM4_SetFileRefCallBack
PlayM4_OpenFile
PlayM4_Play
**(PlayM4_ReversePlay) for reverse playback*
PlayM4_Stop
PlayM4_CloseFile
PlayM4_FreePort

Stream Mode

PlayM4_GetPort
PlayM4_SetStreamOpenMode
PlayM4_OpenStream
PlayM4_SetDisplayBuf
PlayM4_Play
**(PlayM4_ReversePlay) for reverse playback*
PlayM4_InputData
PlayM4_Stop

End of application

Chapter 6 API Description

System Operation and Error Code Query

6.1. Get SDK Version and Build Number PlayM4_GetSdkVersion

DWORD PlayM4_GetSdkVersion();

Description:

Get SDK version and build number.

Parameters:

--

Return:

The higher 16 digits stands for the current build number, digits 9~16 stands for the main version and digit 1~8 is the sub version.

i.e. return value 0x06040105 stands for Version1.5, Build 0604.

Notice:

For the debug version SDKs, there will only be difference in build number.

6.2. Get Error Code PlayM4_GetLastError

DWORD PlayM4_GetLastError (LONG nPort);

Description:

Get the error code.

Parameters:

--

Return:

The value specified the error code. For the error description, please refer to the table in Chapter 3.

6.3. Check Display Capabilities of the System PlayM4_GetCaps

int PlayM4_GetCaps ();

Description:

Check the display capabilities of the system information for the player.

Parameters:

--

Return:

Bit 1-8 respectively stands for the following info (a TRUE value of bitwise AND operation stands for 'support this function'):

SUPPORT_DDRAW

Support DIRECTDRAW. If not, the player SDK cannot function correctly.

SUPPORT_BLT

Support BLT operation. If not, the player SDK cannot function correctly.

SUPPORT_BLTFOURCC

Support color-space conversions during blit operations.

SUPPORT_BLTSHRINKX

Support arbitrary shrinking of a surface along the x-axis (horizontally). This flag is valid only for blit operations.

SUPPORT_BLTSHRINKY

Support arbitrary shrinking of a surface along the y-axis (vertically). This flag is valid only for blit operations.

SUPPORT_BLTSTRETCHX

Support arbitrary stretching of a surface along the x-axis (horizontally). This flag is valid only for blit operations.

SUPPORT_BLTSTRETCHY

Support arbitrary stretching of a surface along the y-axis (vertically). This flag is valid only for blit operations.

SUPPORT_SSE

Support SSE instruction set. If supports, It will get high performance.

SUPPORT_MMX

Support MMX instruction set.

Notice:

If all the above functions are supported by the display adapter, the CPU usage will be lowered greatly. Otherwise it is suggested to keep the size of display window the same as the decoded video.

I.e. If the decoded video is 352*288 (PAL), and the display adapter does not support BLT, then it is suggested to set the display window size as 352*288.

6.4. Initial DirectDraw Surface PlayM4_InitDDraw

```
BOOL PlayM4_InitDDraw (HWND hWnd);
```

Description:

Initialize DirectDraw surface.

Parameters:

hWnd

[in] The window handle of the application mainframe.

Return:

TRUE - API calling succeeds;

0 - API calling fails. To get detailed error information, please call API PlayM4_GetLastError() to get the error definition.

Notice:

1. For SDK version above V1.1, users do not need to call this function.
2. Please kindly notice that for VB & DELPHI developing, please disable the WS_CLIPCHILDREN window style of the dialog box, otherwise the display image will be covered by the controls on the dialog box.

6.5. Release DirectDraw Surface PlayM4_RealeseDDraw

BOOL PlayM4_ReleaseDDraw ();

Description:

Release DirectDraw surface.

Parameters:

--

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

For the SDK version above V1.1, users do not need to call this function.

6.6. Set Timer Type PlayM4_SetTimerType

BOOL _stdcall PlayM4_SetTimerType (LONG nPort, DWORD nTimerType, DWORD nReserved);

Description:

Set the timer for the SDK.

Parameters:

nPort

[in] The port number of the player

nTimerType

[in] **TIMER_1** or **TIMER_2**, please refer to the **MACRO Definition** below.

nReserved

[in] reserved.

Macro Definition:

TIMER_1: Multi-media timer, support up to 16 for each process.

TIMER_2: No numeric limitation, but this timer is with lower precision, and is not recommended for high speed playback.

Channel 0-15 will be assigned to TIMER_1 while other channels will be assigned to TIMER_2 by default.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

This API shall be called before open operation. It is suggested to use TIMER_1 for file playback, and TIMER_2 for live view.

6.7. Get Timer Type PlayM4_GetTimerType

BOOL _stdcall PlayM4_GetTimerType (LONG nPort, DWORD *pTimerType, DWORD *pReserved);

Description:

Get the timer for player SDK.

Parameters:

nPort

[in] The port number of the player

pTimerType

[out] TIMER_1 or TIMER_2;

pReserved

[out] reserved.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.8. Get Valid Port Number PlayM4_GetPort

```
BOOL _stdcall PlayM4_GetPort (LONG* nPort);
```

Description:

Get a valid port number. Valid range of port number is [0, 499].

Parameters:

nPort

[in] Long pointer of get the port number

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.9. Release Player Port PlayM4_FreePort

```
BOOL _stdcall PlayM4_FreePort (LONG nPort);
```

Description:

Release the port number which has been occupied

Parameters:

nPort

[in] Port number of the player

It is suggested to set the **nPort** as -1 after a successful port releasing.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

File Operation

6.10. Open File PlayM4_OpenFile

BOOL PlayM4_OpenFile (LONG nPort, LPSTR sFileName);

Description:

Open the file for playback.

Parameters:

nPort

[in] The port number of the player

sFileName

[in] The file name

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

- The file size ranges from 4KB to 4GB.
- Only support files locally stored on PC.

6.11. Close File PlayM4_CloseFile

BOOL PlayM4_CloseFile (LONG nPort);

Description:

Close the file that has been opened.

Parameters:

nPort

[in] The port number of the player

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Stream Operation

6.12. Set Stream Input Mode PlayM4_SetStreamOpenMode

BOOL PlayM4_SetStreamOpenMode (LONG nPort, DWORD nMode);

Description:

Set stream input mode.

Parameters:

nPort

[in] The port number of the player

nMode

[in] work in stream mode:

0: **STREAME_REALTIME** mode (default)

1: **STREAME_FILE** mode

STREAME_REALTIME mode gives priority to ensuring of real-time performance and preventing of data blocking problem, and is with strict data checking mechanism while **STREAME_FILE** is the contrary.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

This API shall be called before playback starts.

6.13. Get Stream Input Mode PlayM4_GetStreamOpenMode

LONG PlayM4_GetStreamOpenMode (LONG nPort);

Description:

Get stream input mode.

Parameters:

nPort

[in] The port number of the player

Return:

STREAME_REALTIME or STREAME_FILE

6.14. Open Stream PlayM4_OpenStream

BOOL PlayM4_OpenStream (LONG nPort, PBYTE pFileHeadBuf, DWORD nSize, DWORD nBufPoolSize);

Description:

Open the stream for playback (similar with open file).

Parameters:

nPort

[in] The port number of the player

pFileHeadBuf

[in] The file header which is got from the recording callback APIs of network client SDK or card SDK

nSize

[in] The data length of the file header.

nBufPoolSize

[in] Specify the size of the source buffer. It ranges from SOURCE_BUF_MIN to SOURCE_BUF_MAX. Users may encounter decoding failure if nBufPoolSize is too small. It is suggested that nBufPoolSize be no less than 200*1024 for SD (standard definition) devices, and no less than 600*1024 for HD (high definition) devices.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.15. Close Stream PlayM4_CloseStream

BOOL PlayM4_CloseStream (LONG nPort);

Description:

Close the stream which has been opened.

Parameters:

nPort

[in] The port number of the player

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.16. Input Stream Data PlayM4_InputData

BOOL PlayM4_InputData (LONG nPort, PBYTE pBuf, DWORD nSize);

Description:

Input stream data.

Parameters:

nPort

[in] The port number of the player

pBuf

[in] buffer address

nSize

[in] buffer size

Return:

If the data input succeeds, the return value is TRUE.

If the data input fails, the return value is FALSE. Stream data input shall starts after OpenStream, and a FALSE return is often caused by the case of full buffer.

Notice:

Suggestions for data input failure handling:

1. For the data input failure caused by full buffer under **STREAME_REALTIME**

mode, users can either discard the data (which will cause frame loss or incomplete decoding video) or retry after sleep of several milliseconds.

2. For the data input failure caused by full buffer under **STREAME_FILE** mode, users shall retry until input succeeds.

6.17. Open Video/Audio Stream Separately PlayM4_OpenStreamEx

BOOL _stdcall PlayM4_OpenStreamEx (LONG nPort, PBYTE pFileHeadBuf, DWORD nSize, DWORD nBufPoolSize);

Description:

Open video and audio streams separately.

Parameters:

nPort

[in] The port number of the player

pFileHeadBuf

[in] The file header which is got from card

nSize

[in] The size of the file header

nBufPoolSize

[in] Set the size of the source buffer which ranges from SOURCE_BUF_MIN to SOURCE_BUF_MAX

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.18. Close Stream (Video/Audio Separately) PlayM4_CloseStreamEx

BOOL _stdcall PlayM4_CloseStreamEx (LONG nPort);

Description:

Close the stream which has been opened in video/audio-separate mode.

Parameters:

nPort

[in] The port number of the player

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.19. Input Video Data PlayM4_InputVideoData

BOOL _stdcall PlayM4_InputVideoData (LONG nPort, PBYTE pBuf, DWORD nSize);

Description:

Input video stream data got from card

Parameters:

nPort

[in] The port number of the player

pBuf

[in] Pointer of the buffer containing the data to be written to the source buffer

nSize

[in] Number of bytes to write to the source buffer

Return:

If the video input succeeds, the return value is TRUE.

If the video input fails, the return value is FALSE.

6.20. Input Audio Data PlayM4_InputAudioData

```
BOOL _stdcall PlayM4_InputAudioData (LONG nPort, PBYTE pBuf, DWORD nSize);
```

Description:

Input audio stream data.

Parameters:

nPort

[in] The port number of the player

pBuf

[in] Pointer of the buffer which contains the data to write to the source buffer

nSize

[in] buffer size

Return:

If the audio input succeeds, the return value is TRUE.

If the audio input fails, the return value is FALSE.

Notice:

Audio data shall be input after OpenStream. A FALSE return is often caused by case of a full buffer. It is suggested that user stops the thread of data input and retry again to prevent data loss.

Playback Control

6.21. Start Playback PlayM4_Play

BOOL PlayM4_Play (LONG nPort, HWND hWnd);

Description:

Start playback. The display image size will be automatically adjusted according to the hWnd window size. For full screen display, please magnify the hWnd window to full screen size.

If the video is already in playback status, calling this API will reset the playback speed to 1X.

Parameters:

nPort

[in] The port number of the player

hWnd

[in] The handle of the display window.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.22. Stop Playback PlayM4_Stop

BOOL PlayM4_Stop (LONG nPort);

Description:

Stop playback.

Parameters:

nPort

[in] The port number of the player

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.23. Pause Playback PlayM4_Pause

BOOL PlayM4_Pause (LONG nPort, DWORD nPause);

Description:

Pause or resume playback.

Parameters:

nPort

[in] The port number of the player

nPause

[in]

TRUE: pause

FALSE: resume the previous playback process

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.24. Fast Forward PlayM4_Fast

BOOL PlayM4_Fast (LONG nPort);

Description:

Fast forward. This API can be called up to 4 times continuously to increase the playback speed, which will be doubled after each API call. Call PlayM4_Play() to restore 1X playback from the current position.

Parameters:

nPort

[in] The port number of the player

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

HD video may not reach the fast forward speed set by the user due to limitation of decoding and display performance.

6.25. Slow Forward PlayM4_Slow

BOOL PlayM4_Slow (LONG nPort);

Description:

Slow forward. This API can be called up to 4 times continuously to decrease the playback speed, which will be lowered by half after each API call. Call PlayM4_Play() to restore 1X playback from the current position.

Parameters:

nPort

[in] The port number of the player

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.26. Step Forward PlayM4_OneByOne

BOOL PlayM4_OneByOne (LONG nPort);

Description:

Step Forward. Call PlayM4_Play() to restore 1X playback from the current position.

Parameters:

nPort

[in] The port number of the player

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.27. Step Backward PlayM4_OneByOneBack

BOOL PlayM4_OneByOneBack (LONG nPort);

Description:

Step backward. Reverse 1 frame after each API call. This API shall be called after file index is generated.

Parameters:

nPort

[in] The port number of the player

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.28. Play Sound in Exclusive Mode PlayM4_PlaySound

BOOL PlayM4_PlaySound (LONG nPort);

Description:

Open the audio. Only 1-ch audio playback can be enabled, and the audio on other channels will be switched off automatically.

Parameters:

nPort

[in] The port number of the player

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

1. The audio display is disabled by default.
2. PlayM4_PlaySound() and PlayM4_CloseSound() shall be used together in the application. If PlayM4_PlaySound() is called, then PlayM4_OpenSound() shall be called before application ends.

6.29. Stop Sound in Exclusive Mode PlayM4_StopSound

BOOL PlayM4_StopSound ();

Description:

Stop the audio playback.

Parameters:

--

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.30. Play Sound in Share Mode PlayM4_PlaySoundShare

BOOL PlayM4_PlaySoundShare (LONG nPort);

Description:

Open audio from a specified channel in share mode. It doesn't stop audio from other channels.

Parameters:

nPort

[in] The port number of the player

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

Creating of multiple audio devices is not supported on Windows 98 and earlier OS version. If the sound adapter has already been occupied, the API will return FALSE.

6.31. Stop Sound in Share Mode PlayM4_StopSoundShare

BOOL PlayM4_StopSoundShare (LONG nPort);

Description:

Stop audio playback from a specified channel.

Parameters:

nPort

[in] The port number of the player

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

PlayM4_PlaySoundShare() and PlayM4_StopSoundShare() shall be used together in the application. If PlayM4_ PlaySoundShare() is called, then PlayM4_OpenSound() shall be called before application ends.

6.32. Set Volume PlayM4_SetVolume

BOOL PlayM4_SetVolume (LONG nPort, WORD nVolume);

Description:

Set the volume of the PC sound adapter. It may effect other applications related with PC sound devices.

Parameters:

nPort

[in] The port number of the player

nVolume

[in] New volume requested for this sound, range 0-0XFFFF.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

1. If this API is called before playback starts, the return value will be FALSE yet the volume setting will be saved as the initial volume when audio playback starts.
2. This API adjusts the audio output volume of the sound adapter and will effect the audio on all the related applications.

6.33. Get Volume PlayM4_GetVolume

WORD PlayM4_GetVolume (LONG nPort);

Description:

Get the volume level of the PC's audio adapter. It may effect other applications related with the system's display adapter.

Parameters:

nPort

[in] The port number of the player

Return:

Volume.

6.34. Adjust Audio Wave PlayM4_AdjustWaveAudio

BOOL _stdcall PlayM4_AdjustWaveAudio (LONG nPort, LONG nCoefficient);

Description:

Adjust the wave data. This API can be called to adjust the volume of current channel only, while API PlayM4_SetVolume effects on the whole system.

Parameters:

nPort

[in] The port number of the player

nCoefficient

[in] The coefficient. The range from MIN_WAVE_COEF to MAX_WAVE_COEF, 0 means no adjust.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

This API will adjust the audio data directly and only effects on the selected channel. Calling of this API will lower the audio quality, and is not suggested to use unless the user wants to adjust each channel's volume separately.

6.35. Set Picture Quality PlayM4_SetPicQuality

BOOL PlayM4_SetPicQuality (LONG nPort, BOOL bHighQuality);

Description:

Set the image quality. High image quality settings leads to higher CPU usage, and

thus it is suggested to set low quality for multi-channel playback, and switch to high quality when a certain channel is enlarged during display.

Parameters:

nPort

[in] The port number of the player

bHighQuality

[in] 1- high quality; 0- low quality (default)

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.36. Get Picture Quality PlayM4_GetPictureQuality

BOOL PlayM4_GetPictureQuality (LONG nPort, BOOL *bHighQuality);

Description:

Get the quality of the image.

Parameters:

nPort

[in] The port number of the player

bHighQuality

[out] 1- high quality; 0- low quality

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.37. Set Display Video Parameters PlayM4_SetColor

BOOL _stdcall PlayM4_SetColor (LONG nPort, DWORD nRegionNum, int nBrightness, int nContrast, int nSaturation, int nHue);

Description:

Set video parameters of the pictures.

Parameters:

nPort

[in] The port number of the player

nRegionNum:

[in] Display region, please refer to PlayM4_SetDisplayRegion; if there is only one display region (the most common case) it should be set as 0.

nBrightness:

[in] Brightness, default: 64, range: from 0 to 128;

nContrast:

[in] Contrast, default: 64; range: from 0 to 128;

nSaturation:

[in] Saturation, default: 64; range: from 0 to 128;

nHue:

[in] Hue, default: 64; range: from 0 to 128;

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

If all the parameters are set as default level, the color settings will not be adjusted.

6.38. Get Display Video Parameters PlayM4_GetColor

BOOL _stdcall PlayM4_GetColor (LONG nPort, DWORD nRegionNum, int *pBrightness, int *pContrast, int *pSaturation, int *pHue);

Description:

Get the corresponding color value, parameters are as above.

Parameters:

nPort

[in] The port number of the player

nRegionNum:

[in] Display region, please refer to PlayM4_SetDisplayRegion; if there is only one display region (the most common case) it should be set as 0.

nBrightness:

[out] The brightness, default: 64, range: from 0 to 128;

nContrast:

[out] The contrast, default: 64; range: from 0 to 128;

nSaturation:

[out] The saturation, default: 64; range: from 0 to 128;

nHue:

[out] The hue, default: 64; range: from 0 to 128;

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.39. Set Image Sharpness PlayM4_SetImageSharpen

BOOL PlayM4_SetImageSharpen(LONG nPort,DWORD nLevel);

Description:

Set the sharpness level of the image.

Parameters:

nPort

[in] The port number of the player

nLevel

[in] Sharpness level, range: from 0(disable, by default) to 6 (highest).

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.40. Set Overlay Flip Mode PlayM4_SetOverlayFlipMode

BOOL PlayM4_SetOverlayFlipMode(LONG nPort,BOOL bTrue);

Description:

Set the overlay flip.

Parameters:

nPort

[in] The port number of the player

bTrue

[in] TRUE-flip; FALSE-disable flip

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

This API is previously used to enable pre-created buffer for overlay surface, and becomes invalid from V6.1.0.3.

6.41. Set Playback Position (Percentage) PlayM4_SetPlayPos

BOOL PlayM4_SetPlayPos (LONG nPort, float fRelativePos);

Description:

Locate the relative playback position of the file (percentage). To get precise locating performance, please create file index before executing this operation, otherwise it can only achieve rough locating.

Parameters:

nPort

[in] The port number of the player

fRelativePos

[in] The percent of the file relative position. It is from 0% to 100%.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.42. Get Playback Position (Percentage) PlayM4_GetPlayPos

float PlayM4_GetPlayPos (LONG nPort);

Description:

Get the relative playback position of file (percentage).

Parameters:

nPort

[in] The port number of the player

Return:

The percentage of the file's relative playback position, ranges from 0% to 100%.

6.43. Set Playback Position (ms) PlayM4_SetPlayedTimeEx

```
BOOL    PlayM4_SetPlayedTimeEx (LONG nPort, DWORD nTime);
```

Description:

Set the new position in the file in milliseconds for playback. To get precise locating performance, users need to create file index before executing this operation, otherwise it can only achieve rough locating.

Parameters:

nPort

[in] The port number of the player

nTime

[in] Start time for playback

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.44. Get Playback Position (ms) PlayM4_GetPlayedTimeEx

```
DWORD PlayM4_GetPlayedTimeEx (LONG nPort);
```

Description:

Get the current playback position of the file in milliseconds.

nPort

[in] The port number of the player

Return:

The current playback position of the file (unit: millisecond)

6.45. Set Playback Position (Frame) PlayM4_SetCurrentFrameNum

```
BOOL PlayM4_SetCurrentFrameNum (LONG nPort, DWORD nFrameNum);
```

Description:

Specifies the playback position in the file (unit: frames) from the beginning. To get precise locating performance, users need to create file index before executing this operation, otherwise it can only achieve rough locating.

Parameters:

nPort

[in] The port number of the player

nFrameNum

[in] The starting frame number for playback

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.46. Get Playback Position (Frame) PlayM4_GetCurrentFrameNum

```
DWORD       PlayM4_GetCurrentFrameNum (LONG nPort);
```

Description:

Get the current playback position in the file in frame number from the beginning

Parameters:

nPort

[in] The port number of the player

Return:

The current frame number for playback

6.47. Image De-flashing PlayM4_SetDeflash

BOOL _stdcall PlayM4_SetDeflash (LONG nPort, BOOL bDeflash);

Description:

This API reduces the image flashing (refreshing) problem under scenario of static image with noise.

Parameters:

nPort

[in] The port number of the player

bDeflash

[in] TRUE- enable de-flashing; FALSE- disable de-flashing

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Get Playback or Decoding Information

6.48. Get Time Duration of the File PlayM4_GetFileTime

DWORD PlayM4_GetFileTime (LONG nPort);

Description:

Get total file duration (unit: second).

Parameters:

nPort

[in] The port number of the player

Return:

The total file duration in seconds.

6.49. Get Frame Count of the File PlayM4_GetFileTotalFrames

DWORD PlayM4_GetFileTotalFrames (LONG nPort);

Description:

Get the total frame number of the file.

Parameters:

nPort

[in] The port number of the player

Return:

The total frame count of the file

6.50. Get Current Frame Rate PlayM4_GetCurrentFrameRate

DWORD PlayM4_GetCurrentFrameRate (LONG nPort);

Description:

Get the current frame rate.

Parameters:

nPort

[in] The port number of the player

Return:

The current frame rate

If the frame rate is lower than 1fps, this API will return 0.

6.51. Get Played Time PlayM4_GetPlayedTime

DWORD PlayM4_GetPlayedTime (LONG nPort);

Description:

Get played time count for the current file (unit: second)

Parameters:

nPort

[in] The port number of the player

Return:

The played time of the current file, counted from the beginning of the file.

6.52. Get Decoded Frame Count PlayM4_GetPlayedFrames

DWORD PlayM4_GetPlayedFrames (LONG nPort);

Description:

Get the decoded frame number.

Parameters:

nPort

[in] The port number of the player

Return:

The decoded frame number of the file

6.53. Get Original Image Size PlayM4_GetPictureSize

BOOL PlayM4_GetPictureSize(LONG nPort,LONG *pWidth,LONG *pHeight);

Description:

Get the original image size of the video.

Parameters:

nPort

[in] The port number of the player

LONG *pWidth

[out] original image width, i.e. for CIF/PAL video, the image width is 352

LONG *pHeight

[out] original image height, i.e. for CIF/PAL video, the image height is 288

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

This API gets the size of the latest decoded image. Therefore it shall be called after playback starts to get the precise information. It is suggested to call this API together with PlayM4_SetEncTypeChangeCallback() or PlayM4_SetEncChangeMsg().

6.54. Get File Header Length PlayM4_GetFileHeadLength

DWORD PlayM4_GetFileHeadLength ();

Description:

Get the length of the file header or info header for data exchange purpose.

Parameters:

--

Return:

The size of the file header.

Sample:

CFile m_TestFile;

```
void Start ()
{
    //Get file header length
    DWORD nLength= PlayM4_GetFileHeadLength ();
    PBYTE pFileHead=new BYTE[nLength];
    //Open File
    m_TestFile.Open ("test.mp4 ", CFile: : modeRead, NULL);
    m_TestFile.Read (pFileHead, nLength);
    //Set Stream Mode
    PlayM4_SetStreamOpenMode (0, STREAME_FILE);
    //Open Stream
    if (!PlayM4_OpenStream (0, pFileHead, nLength, 1024*100))
    {
        m_strPlayFileName="";
        MessageBox ("Open File Failure");
    }
    //Playback
    m_bPlaying = PlayM4_Play ( 0, m_hWnd);
    delete []pFileHead;
}
//////////////////////////////////////////////////////////////////////////////
void InputData ()
{
    BYTE pBuf[4096];
    m_TestFile.Read (pBuf, sizeof (pBuf));
    while (!PlayM4_InputData (0, pBuf, sizeof (pBuf)))
    {
        if (!m_bPlaying)
            break;//If the playback has already been stopped, exit
        TRACE ("SLEEEP \n");
        Sleep (5);
    }
}
```

6.55. Get Global Timestamp PlayM4_GetSpecialData

DWORD PlayM4_GetSpecialData(LONG nPort);

Description:

Get the global timestamp of current frame.

Parameters:

nPort

[in] The port number of the player

Return:

If the function succeeds, the return value is a compressed data for global time (unit:

second).

#define GET_YEAR(_time_) (((_time_)>>26) + 2000)
#define GET_MONTH(_time_) (((_time_)>>22) & 15)
#define GET_DAY(_time_) (((_time_)>>17) & 31)
#define GET_HOUR(_time_) (((_time_)>>12) & 31)
#define GET_MINUTE(_time_) (((_time_)>>6) & 63)
#define GET_SECOND(_time_) (((_time_)>>0) & 63)

FALSE - API calling fails.

Notice:

This API gets the size of the latest decoded image. Therefore it shall be called after playback starts to get the precise information. It is suggested to call this API together with PlayM4_SetEncTypeChangeCallback() or PlayM4_SetEncChangeMsg().

Decoding Operation & Control

6.56. Set Callback Stream Type PlayM4_SetDecCBStream

BOOL _stdcall PlayM4_SetDecCBStream (LONG nPort, DWORD nStream);

Description:

Set stream type for decoding callback

Parameters:

nPort

[in] The port number of the player

nStream

[in]1. video stream; 2.audio stream; 3.video & audio stream

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.57. Set Frame Type PlayM4_SetDecodeFrameType

BOOL PlayM4_SetDecodeFrameType(LONG nPort,DWORD nFrameType);

Description:

Set frame type for video frame decoding

Parameters:

nPort

[in] The port number of the player

nFrameType

[in]

#define DECODE_NORMAIL	0 -Decode video frames
#define DECODE_KEY_FRAME	1- Decode key frames
#define DECODE_NONE	2- Do not decode video frames

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.58. Decoder Callback PlayM4_SetDecCallBack

BOOL PlayM4_SetDecCallBack (LONG nPort, void (CALLBACK* DecCBFun) (long nPort, char * pBuf, long nSize, FRAME_INFO * pFrameInfo, long nReserved1, long nReserved2));

Description:

Register a callback function for user-controllable display.

Parameters:

nPort

[in] The port number of the player

DecCBFun

[in] Pointer of the decoder callback function, can't be set as NULL.

Description of the Callback Function:

nPort

The port number of the player

pBuf

Pointer of the decoded video/audio buffer

nSize

Size of pBuf

pFrameInfo

Pointer of FRAME_INFO structure

nReserved1

Reserved

nReserved2

Reserved

Description of structure FRAME_INFO:

```
typedef struct{
  long nWidth;        //Image width in pixels or sound track number
  long nHeight;       // Image height in pixels or audio bit rate
  long nStamp;        //Time stamp in milliseconds
  long nType;         // Received data type as the Macro Definition below
  long nFrameRate;    //Encoding frame rate or audio sampling rate
}FRAME_INFO;
```

Macro Definition:

T_AUDIO16	PCM Audio, sampling rate: 16 Khz, Mono, 16 bits
T_RGB32	RGB 32 image, 4 bytes per pixel arranged in 'B-G-R-0…' similar as bitmap (starts from the bottom-left of the image) (Reserved)
T_UYVY	uyvy image, arranged in "U0-Y0-V0-Y1-U2-Y2-V2-Y3…." (starts from the bottom-left of the image) format (Reserved)
T_YV12	yv12 image arranged in "Y0-Y1-……""V0-V1….""U0-U1-….." format

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

- Currently only T_YV12 format raw video data is supported.
- This API shall be called before **PlayM4_Play** and will be invalid automatically after **PlayM4_Stop.**
- The decoding function provides no speed control, and the decoding starts whenever the call back function returns. To use this function, user shall understand mechanisms of video & audio display. Please refer to DirectX development package about the relative knowledge.

6.59. Callback with User Data PlayM4_SetDecCallBackMend

BOOL _stdcall PlayM4_SetDecCallBackMend (LONG nPort, void (CALLBACK* DecCBFun) (long nPort, char * pBuf, long nSize, FRAME_INFO * pFrameInfo, long nUser, long nReserved2), long nUser);

Description:

Register a callback function to replace the displayed part. It is controlled by user. It is called back before **PlayM4_Play** and will be invalid automatically when **PlayM4_Stop**. Also it needs to be reset before recalling back **PlayM4_Play**. Please be aware that the decoded part does not control speed, and as user returns from call back function, the decoder will decode the next part of data. To use this function, user must understand video display and audio play. Please refer to directx development package about the relative knowledge.

Parameters:

nPort

[in] The port number of the player

DecCBFun

[in] Pointer of the decoder callback function, can't be set as NULL.

Description of the Callback Function:

nPort:

The port number of the player

pBuf:

Pointer of the decoded video/audio buffer

nSize:

Size of pBuf

pFrameInfo:

Pointer of FRAME_INFO structure

nUser:

User data

nReserved2:

Reserved

Description of structure FRAME_INFO:

```
typedef struct{
  long nWidth;        //Image width in pixels or sound track number
  long nHeight;       // Image height in pixels or audio bit rate
  long nStamp;        //Time stamp in milliseconds
  long nType;         //Received data type as the Macro Definition below
  long nFrameRate;    //Encoding frame rate or audio sampling rate
}FRAME_INFO;
```

Macro Definition:

T_AUDIO16	PCM Audio, sampling rate: 16 Khz, Mono, 16 bits
T_RGB32	RGB 32 image, 4 bytes per pixel arranged in 'B-G-R-0…' similar as bitmap (starts from the bottom-left of the image) (Reserved)

T_UYVY	uyvy image, arranged in "U0-Y0-V0-Y1-U2-Y2-V2-Y3…." (starts from the bottom-left of the image) format (Reserved)
T_YV12	yv12 image arranged in "Y0-Y1-……""V0-V1….""U0-U1-….." format

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

- Currently only T_YV12 format raw video data is supported.
- This API shall be called before **PlayM4_Play** and will be invalid automatically after **PlayM4_Stop.**
- The decoding function provides no speed control, and the decoding starts whenever the call back function returns. To use this function, user shall understand mechanisms of video & audio display. Please refer to DirectX development package about the relative knowledge.

6.60. Callback with Data & Length PlayM4_SetDecCallBackEx

BOOL PlayM4_SetDecCallBackEx(LONG nPort,void (CALLBACK* DecCBFun)(long nPort,char * pBuf,long nSize,FRAME_INFO * pFrameInfo, long nReserved1,long nReserved2), char* pDest, long nDestSize);

Description:

PlayM4_SetDecCallBackEx() decodes and displays the data, and send the decoding data to the user via callback mode, while PlayM4_SetDecCallBack() decodes but not displays.

The parameter pDest and nDestSize can be set as NULL and 0.

Parameters:

nPort

[in] The port number of the player

DecCBFun

[in] Pointer of the decoder callback function, can't be set as NULL.

pDest:

Target data, shall be set as NULL

nDestSize:

Target data size, shall be set as 0

Description of the Callback Function:

nPort:

The port number of the player

pBuf:

Pointer of the decoded video/audio buffer

nSize:

Size of pBuf

pFrameInfo:

Pointer of FRAME_INFO structure

nReserved2:

Reserved

nReserved2:

Reserved

Description of structure FRAME_INFO:

```
typedef struct{
  long nWidth;          //Image width in pixels or sound track number
  long nHeight;         // Image height in pixels or audio bit rate
  long nStamp;          //Time stamp in milliseconds
  long nType;           //Received data type as the Macro Definition below
  long nFrameRate;      //Encoding frame rate or audio sampling rate
}FRAME_INFO;
```

Macro Definition:

T_AUDIO16	PCM Audio, sampling rate: 16 Khz, Mono, 16 bits
T_RGB32	RGB 32 image, 4 bytes per pixel arranged in 'B-G-R-0…' similar as bitmap (starts from the bottom-left of the image) (Reserved)
T_UYVY	uyvy image, arranged in "U0-Y0-V0-Y1-U2-Y2-V2-Y3…." (starts from the bottom-left of the image) format (Reserved)
T_YV12	yv12 image arranged in "Y0-Y1-……""V0-V1….""U0-U1-….." format

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.61. Callback with User Data & Data Length

PlayM4_SetDecCallBackExMend

```
BOOL PlayM4_SetDecCallBackExMend(LONG nPort, void (CALLBACK* DecCBFun)(long nPort, char* pBuf, long nSize, FRAME_INFO* pFrameInfo, long nUser, long nReserved2), char* pDest, long nDestSize, long nUser);
```

Description:

PlayM4_SetDecCallBackExMend() decodes and displays the data, and send the decoding data to the user via callback mode, while PlayM4_SetDecCallBackMend() only decodes but not displays.

The parameter pDest and nDestSize can be set as NULL and 0.

Parameters:

nPort

[in] The port number of the player

DecCBFun

[in] Pointer of the decoder callback function, can't be set as NULL.

pDest:

Target data, shall be set as NULL

nDestSize:

Target data size, shall be set as 0

nUser:

User parameter

Description of the Callback Function:

nPort:

The port number of the player

pBuf:

Pointer of the decoded video/audio buffer

nSize:

Size of pBuf

pFrameInfo:

Pointer of FRAME_INFO structure

nUser:

User data

nReserved2:

Reserved

Description of structure FRAME_INFO:

```
typedef struct{
  long nWidth;        //Image width in pixels or sound track number
  long nHeight;       // Image height in pixels or audio bit rate
  long nStamp;        //Time stamp in milliseconds
  long nType;         //Received data type as the Macro Definition below
  long nFrameRate;    //Encoding frame rate or audio sampling rate
}FRAME_INFO;
```

Macro Definition:

T_AUDIO16	PCM Audio, sampling rate: 16 Khz, Mono, 16 bits
T_RGB32	RGB 32 image, 4 bytes per pixel arranged in 'B-G-R-0…' similar as bitmap (starts from the bottom-left of the image) (Reserved)
T_UYVY	uyvy image, arranged in "U0-Y0-V0-Y1-U2-Y2-V2-Y3…." (starts from the bottom-left of the image) format (Reserved)
T_YV12	yv12 image arranged in "Y0-Y1-……""V0-V1….""U0-U1-….." format

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.62. Set Audio Callback PlayM4_SetAudioCallBack

Notice:

This is a reserved function for future functional expanding and is invalid yet.

```
BOOL _stdcall PlayM4_SetAudioCallBack (LONG nPort, void (_stdcall * funAudio) (long nPort, char * pAudioBuf, long nSize, long nStamp, long nType, long nUser), long nUser);
```

Description:

Register a callback function to refer to the wave format data that have been

decoded out.

Parameters:

nPort

[in] The port number of the player

funAudio

the callback function pointer.

nUser

user data.

Description of the Callback Function:

void _stdcall Audio (long nPort, char * pAudioBuf, long nSize, long nStamp, long nType, long nUser)

nPort

Port

pAudioBuf

Wave data

nSize wave

Data size

nStamp

Time stamp (ms)

nType

Audio type: T_AUDIO16: 16 KHz, mono, 16 bit per sampling

nUser

User data

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.63. Set File End Message PlayM4_SetFileEndMsg

BOOL PlayM4_SetFileEndMsg (LONG nPort, HWND hWnd, UINT nMsg);

Description:

Register a windows message which will be post when the file reaches its end. For player SDK version above V2.4, when the file is end, the decoding thread will not stop by itself, and the users will need to call **PlayM4_Stop (nPort) after** received this message to stop the playback**.**

Parameters:

nPort

[in] The port number of the player

HWnd

[in] The handle to the window to receive this message.

nMsg

[in] The message is defined by an application. When received this message, it means that the file which is playing is end.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

API PlayM4_SetFileEndMsg and API PlayM4_SetFileEndCallback shall not be called at the same time.

6.64. Set File End Callback PlayM4_SetFileEndCallback

BOOL_stdcall PlayM4_SetFileEndCallback (LONG nPort, void (CALLBACK *FileEndCallback) (long nPort, void *pUser), void *pUser);

Description:

Set callback for decoding file end. This API should be called before PlayM4_OpenSteam () or PlayM4_OpenFile ()

Parameters:

nPort

[in] The port number of the player

FileEndCallback

[in] Callback function described below

pUser

[in] Parameter of callback function

Callback function Description:

*void (CALLBACK*FileEndCallback) (long nPort, void *pUser)*

Parameters:

nPort:

Port number

pUser:

User defined parameters, as the last parameter pUser of PlayM4_SetFileEndCallback ().

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

1. For the callback functions, as VB does not support multi-thread, thus problems may occur when calling API defined in VB under VC environment. Please refer to: **Microsoft Knowledge Base Article - Q198607 "PRB: Access Violation in VB Run-Time Using AddressOf "** for detail information.
2. PlayM4_SetFileEndMsg and PlayM4_SetFileEndCallback shall not be called at the same time.

6.65. Notify on Resolution Changing PlayM4_SetEncChangeMsg

BOOL _stdcall PlayM4_SetEncChangeMsg (LONG nPort, HWND hWnd, UINT nMsg);

Description:

Set a notify message when there is change in the encoding resolution

Parameters:

nPort

[in] The port number of the player

hWnd

[in] handle of the message window

nMsg

[in] user will receive this message on changing of encoding resolution, the parameter 'WParam' in this message is the returned nPort

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

PlayM4_SetEncChangeMsg and PlayM4_SetEncTypeChangeCallBack shall not be called at the same time.

6.66. Set Resolution-Change Callback PlayM4_SetEncTypeChangeCallBack

BOOL _stdcall PlayM4_SetEncTypeChangeCallBack (LONG nPort, void (CALLBACK *funEncChange) (long nPort, long nUser), long nUser);

Description:

Set a callback function to notify change of encoding resolution

Parameters:

nPort

[in] The port number of the player

funEncChange

Callback function;

nUser

User data

Callback Function Descripton:

*void (CALLBACK *funEncChange) (long nPort, long nUser)*

nPort

The port number of the player

nUser

User data

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

1. This API shall be called before PlayM4_OpenFile.
2. PlayM4_SetEncChangeMsg and PlayM4_SetEncTypeChangeCallBack shall not be called at the same time.

6.67. Throw B Frame(s) PlayM4_ThrowBFrameNum

BOOL PlayM4_ThrowBFrameNum (LONG nPort, DWORD nNum);

Description:

Set the number of B frame(s) to be skipped during decoding. Skipping of B frame(s) can reduce CPU usage. If there is no B frames in the stream, this function will not take effect. This mechanism can be applied to fast forward or multi-channel playback modes to reduce the PC load.

Parameters:

nPort

[in] The port number of the player

nNum

[in] The number of B-frame that is not decoded. It ranges from 0 to 2.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.68. Check Frame Continuity PlayM4_CheckDiscontinuousFrameNum

BOOL _stdcall PlayM4_CheckDiscontinuousFrameNum (LONG nPort, BOOL bCheck);

Description:

Check the continuity of decoding frames. If discontinuity of frames is detected, the decoder will jump to the next I frame.

Parameters:

nPort

[in] The port number of the player

bCheck

[in]

TRUE- enable continuity checking and jump to the next I frame when discontinuity detected;

FALSE- disable continuity checking

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

This function is valid in since SDK V6.1.1.17.

6.69. Set Decryption Key PlayM4_SetSecretKey

BOOL __stdcall PlayM4_SetSecretKey (LONG nPort, LONG lKeyType, char *pSecretKey, LONG lKeyLen);

Description:

If a secret key has been set for encryption purpose during the encoding process, then this API shall be called before PlayM4_OpenSteam or PlayM4_OpenFile for decryption.

Parameters:

nPort

[in] The port number of the player

lKeyType

[in] secret key type

pSecretKey

[in] secret key string

lKeyLen

[in] key length (unit: bit)

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Display Operation

6.70. Set Overlay Mode and Color Key PlayM4_SetOverlayMode

BOOL PlayM4_SetOverlayMode (LONG nPort, BOOL bOverlay, COLORREF colorKey) ;

Description:

Set display surface and color key for overlay mode.

Parameters:

nPort

[in] The port number of the player

bOverlay

[in]

TRUE- Set the display mode as OVERLAY by default, and try other mode (off-screen) only if OVERLAY fails

FALSE- Do not use OVERLAY mode

colorKey

[in] If bOverlay is set as TRUE, user shall set the color key for overlay surface. User shall paint this color on the display region of overlay to see the image.

This parameter is a DWORD value which shall be represented in 0x00bbggrr mode, the highest digits are set as 0 and the last 3 bytes stands for the value of R/G/B.

As in color keying mode all the other colors penetrate through this key color and displays on overlay surface, it is suggested to set a non-common color in the scenario as the color key.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

Overlay mode is widely supported by different display adapters and it can be applied to get good-quality image and lower CPU usage if the display adapter does not support BLT and color-conversion. However, there is only 1 overlay surface for each display adapter, and if it is occupied by other Apps (i.e. common player Apps, live view of compression card), then the player cannot use overlay mode and will switch to off-screen mode automatically. This API will not return FALSE in this case.

6.71. Display Mode Query PlayM4_GetOverlayMode

LONG PlayM4_GetOverlayMode (LONG nPort);

Description:

Check if the player is in OVERLAY mode or not.

Parameters:

nPort

[in] The port number of the player

Return:

-1: API calling failure

0: Off-screen mode

1: Overlay mode

6.72. Get Overlay Color Key PlayM4_GetColorKey

COLORREF PlayM4_GetColorKey (LONG nPort);

Description:

Get the color key of the OVERLAY surface.

Parameters:

nPort

[in] The port number of the player

Return:

The value of the color key- a DWORD value represented in 0x00bbggrr mode, in which the last 3 bytes stands for the value of R/G/B.

6.73. Set/Add Display Region PlayM4_SetDisplayRegion

BOOL _stdcall PlayM4_SetDisplayRegion (LONG nPort, DWORD nRegionNum, RECT *pSrcRect, HWND hDestWnd, BOOL bEnable);

Description:

Set or add display regions, also applies to partial enlargement.

Parameters:

nPort

[in] The port number of the player

nRegionNum

[in] Display region number from 0 to (MAX_DISPLAY_WND-1). If nRegionNum is set as 0, it stands for setting of the main display window (window set in PlayM4_Play) and hDestWnd and bEnable settings will not be handled in this mode.

pSrcRect

[in] Set the region to be displayed (this region shall be inside the original image), i.e. if the resolution of original image is 352*288, the range of pSrcRect shall not exceed (0, 0, 352, 288).

If pSrcRect is set as NULL, the whole image will be displayed.

hDestWnd

[in] Set the display window. If the window for this region has already been set or opend, then this parameter will be neglected.

bEnable

[in] Open /set or close the display region.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.74. Refresh Display PlayM4_RefreshPlay

BOOL PlayM4_RefreshPlay (LONG nPort) ;

Description:

Refresh/retrieve image display after the refreshing of display window under PAUSE status. This API is only valid under pause and step forward status, otherwise it will return directly.

Parameters:

nPort

[in] The port number of the player

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.75. Refresh Display for Multiple Regions PlayM4_RefreshPlayEx

```
BOOL _stdcall PlayM4_RefreshPlayEx (LONG nPort, DWORD nRegionNum);
```

Description:

Refresh display for multiple display regions.

Parameters:

nPort

[in] The port number of the player

nRegionNum

[in]display region serial number.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.76. Set Normal/Quarter Display Mode PlayM4_SetDisplayType

```
BOOL PlayM4_SetDisplayType (LONG nPort, LONG nType);
```

Description:

Switch between DISPLAY_NORMAL and DISPLAY_QUARTER modes. DISPLAY_QUARTER mode can reduce the work load of display adapter in the cost of image quality, and is suitable to apply in small-window-size viewing mode. For normal display or single-channel viewing, usually it's better to apply DISPLAY_NORMAL mode.

Parameters:

nPort

[in] The port number of the player

nType

[in]

DISPLAY_NORMAL Send the decoded data to display adapter normally

DISPLAY_QUARTER Transmit 1/4 resolution data to display adapter

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.77. Normal/Quarter Display Mode Query PlayM4_GetDisplayType

long PlayM4_GetDisplayType (LONG nPort);

Description:

Check the current display mode.

Parameters:

nPort

[in] The port number of the player

Return:

DISPLAY_NORMAL or DISPLAY_QUARTER

Source Buffer Operation

**Source buffer is the buffer for the data to be decoded*

6.78. Free Space Query PlayM4_GetSourceBufferRemain

DWORD PlayM4_GetSourceBufferRemain (LONG nPort);

Description:

Get the free space information of the source buffer.

Parameters:

nPort

[in] The port number of the player

Return:

Free space of the source buffer (unit: Byte).

6.79. Threshold Setting & Callback PlayM4_SetSourceBufCallBack

BOOL PlayM4_SetSourceBufCallBack (LONG nPort, DWORD nThreShold, void (CALLBACK * SourceBufCallBack) (long nPort, DWORD nBufSize, DWORD dwUser, void*pResvered), DWORD dwUser, void *pReserved);

Description:

Set a threshold for the free space of source buffer, and register a notification callback when the free space falls below the threshold.

PlayM4_ResetSourceBufFlag() shall be called after each triggering of threshold notification callback to re-enable this callback notification again.

Parameters:

nPort

[in] The port number of the player

nThreShold

[in] Threshold for the free space of source buffer

SourceBufCallBack

[in] pointer of the callback function

dwUser

[in] user data

pResvered

[in] reserved

Description of the Callback Function:

*void CALLBACK SourceBufCallBack (long nPort, DWORD nBufSize, DWORD dwUser, void*pContext) ;*

Parameters:

nPort

The port number of the player

nBufSize

Number of bytes remained of the source buffer.

dwUser

user data .

pResvered

reserved.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

PlayM4_ResetSourceBufFlag() shall be called after each triggering of threshold notification callback to re-enable this callback notification again.

6.80. Reset Threshold Callback PlayM4_ResetSourceBufFlag

BOOL PlayM4_ResetSourceBufFlag (LONG nPort);

Description:

Re-enable the callback of Source Buffer Threshold. Every time the source buffer threshold notification is triggered, this API shall be called afterwards to reset the buffer threshold detecting status and re-enable callback notification again.

Parameters:

nPort

[in] The port number of the player

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Decode Buffer Operation

**Decode buffer is the buffer for the decoded data*

6.81. Set Buffering Size PlayM4_SetDisplayBuf

BOOL PlayM4_SetDisplayBuf (LONG nPort, DWORD nNum);

Description:

Set the buffer size for playback (buffer of decoded images). This buffer is directly related with the fluency and real-time performance of playback. Larger buffer size usually means higher fluency yet longer time delay, and thus it is suggested to set larger buffer size for OpenFile mode (if the system memory is large enough). The default buffer size would be 15 (frames) for Open File mode, which is, about 0.6 sec under cases of 25fps; and 10 (frames) for Open Stream mode.

Parameters:

nPort

[in] The port number of the player

nNum

[in] The number of frames to be buffered, range: from MIN_DIS_FRAMES to MAX_DIS_FRAMES

MIN_DIS_FRAMES

The minimum number of image frames to be buffered.

MAX_DIS_FRAMES

The maximum number of image frames to be buffered.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

This function shall be called between PlayM4_OpenStream and PlayM4_Play.

6.82. Buffering Size Query PlayM4_GetDisplayBuf

```
DWORD PlayM4_GetDisplayBuf (LONG nPort);
```

Description:

Get the buffering size (unit: frame number) of the playback buffer.

Parameters:

nPort

[in] The port number of the player

Return:

The maximum number of image frames to be buffered.

Source Buffer & Decode Buffer Operation

6.83. Clear All Buffer PlayM4_ResetSourceBuffer

```
BOOL PlayM4_ResetSourceBuffer (LONG nPort);
```

Description:

Clear the data in all the buffer.

Parameters:

nPort

[in] The port number of the player

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.84. Clear Specified Buffer PlayM4_ResetBuffer

```
BOOL _stdcall PlayM4_ResetBuffer (LONG nPort, DWORD nBufType);
```

Description:

Clear the data in a specified buffer.

Parameters:

nPort

[in] The port number of the player

nBufType

[in]

BUF_VIDEO_SRC: Video source buffer, valid for stream mode.

BUF_AUDIO_SRC: Audio source buffer, valid for video/audio separate stream mode.

BUF_VIDEO_RENDER: Video decode buffer.

BUF_AUDIO_RENDER: Audio decode buffer.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.85. Buffer Info Query PlayM4_GetBufferValue

```
DWORD _stdcall PlayM4_GetBufferValue (LONG nPort, DWORD nBufType);
```

Description:

Get the data size of specified buffer.

Parameters:

nPort

[in] The port number of the player

nBufType

[in]

BUF_VIDEO_SRC: Video source buffer, valid for stream mode (unit: Byte)

BUF_AUDIO_SRC: Audio source buffer, valid for video/audio separate stream mode (unit: Byte)

BUF_VIDEO_RENDER: remained data for video decode buffer (unit: Frame)

BUF_AUDIO_RENDER: remained data for audio decode buffer (unit: Frame, every 40ms audio is divided as a frame)

Return:

Current data length in the specified buffer

File Index

6.86. Set File Index Callback PlayM4_SetFileRefCallBack

BOOL PlayM4_SetFileRefCallBack (LONG nPort,
void (_stdcall *pFileRefDone) (DWORD nPort, DWORD nUser), DWORD nUser);

Description:

Register a callback function to notify the user when the key frame index for the file is created. If the callback is not triggered, it indicates errors in the file.

The file index is used for fast locating in the file. The indexing speed is about 40MB per second. All the Index-related APIs shall be called after indexing, and the other APIs will not be affected.

Parameters:

nPort

[in] The port number of the player

SetFileRefCallBack

[in] pointer of callback function

nUser

[in] user data

Description of the Callback Function:

void FileRefDone (DWORD nPort, DWORD nUser)

Parameters:

nPort

The port number of the player

nUser

User data

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.87. Locate Previous Key Frame PlayM4_GetKeyFramePos

BOOL PlayM4_GetKeyFramePos (LONG nPort, DWORD nValue, DWORD nType, PFRAME_POS pFramePos);

Description:

Locate the nearest key frame before the designated position. As the decoding process shall start from a key frame, and any data before the first key frame will be discarded, users shall start clip/playback from a key frame (it doesn't matter much if it ends with key frame or not, and the maximum frame loss number at the file end position is 3).

Parameters:

nPort

[in] The port number of the player

nValue

[in] User-specified position

nType

[in] How the position is presented, either BY_FRAMENUM or BY_FRAMETIME

pFramePos

[out] Pointer of FRAME_POS structure

Structure Description:

```
typedef struct{
    long nFilePos;          //Nearest Key Frame Position in File
    long nFrameNum;         // Frame number of nearest key frame
    long nFrameTime;        //The time stamp of nearest key frame (unit: ms).
}FRAME_POS, *PFRAME_POS;
```

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

PlayM4_GetKeyFramePos and PlayM4_GetNextKeyFramePosition can be called to achieve video clip function after the file index has been successfully created. The clip precision is related with key frame interval of the original file.

6.88. Locate Next Key Frame PlayM4_GetNextKeyFramePos

BOOL PlayM4_GetNextKeyFramePos (LONG nPort, DWORD nValue, DWORD nType, PFRAME_POS pFramePos);

Description:

Get the position of a key frame after the designated position.

Parameters:

nPort

[in] The port number of the player

nValue

[in] User-specified position

nType

[in] How the position is presented, either BY_FRAMENUM or BY_FRAMETIME

pFramePos

[out] Pointer of FRAME_POS structure

Structure Description:

```
typedef struct{
    long nFilePos;          //Nearest Key Frame Position in File
    long nFrameNum;         // Frame number of nearest key frame
    long nFrameTime;        //The time stamp of nearest key frame (unit: ms).
}FRAME_POS, *PFRAME_POS;
```

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

PlayM4_GetKeyFramePos and PlayM4_GetNextKeyFramePosition can be called to achieve video clip function after the file index has been successfully created. The clip precision is related with key frame interval of the original file.

6.89. Get File Index Info PlayM4_GetRefValue

BOOL _stdcall PlayM4_GetRefValue (LONG nPort, BYTE *pBuffer, DWORD *pSize);

Description:

Get the file index information. User must call this after the file index has been created.

Parameters:

nPort

[in] The port number of the player

pBuffer

[in] The buffer of index information

pSize

[in/out] Input the pBuffer size and output the index size, i.e. on first time calling, users can set *pSize=0; pBuffer=NULL;* and get the buffer size needed from the return valud of pSize, then re-call this API after assigning enough buffer size.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.90. Set File Index PlayM4_SetRefValue

BOOL _stdcall PlayM4_SetRefValue (LONG nPort, BYTE *pBuffer, DWORD nSize);

Description:

If the file index has already been created, user can input it directly via this API and does not need to call PlayM4_SetFileRefCallBack.

Parameters:

nPort

[in] The port number of the player

pBuffer

[in]The file index information

nSize

[in]The size of the index information

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

This API shall be called after PlayM4_OpenFile, and please make sure that the length and content of the file index is correct.

Multi-screen Playback

Notice:

The Following APIs in this section are specially added for multi display adapters support. Only operation systems sith Windows98, Windows2000 and Windows2000 supports multi display adapters and needed installing DirectX6.0 or more advanced edition. If user needn't environment of supporting multi display adapters, these interfaces are dismissal. With regards to multi display adapters, please consult correlative file "Multiple-Monitor Systems " of Microsoft sdk.

SDK version above V6.1.1.0 is self-adaptive to multi-screen display, and users do not need to call the APIs in this section.

6.91. Enum the Display Devices in the System PlayM4_InitDDrawDevice

BOOL PlayM4_InitDDrawDevice();

Description:

Enumerate display devices of system

Parameters:

--

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.92. Release Display Device Resource PlayM4_ReleaseDDrawDevice

void PlayM4_ReleaseDDrawDevice ();

Description:

Release resource distributed in the course of enumerating display devices

6.93. Get Display Adapter Number PlayM4_GetDDrawDeviceTotalNums

DWORD PlayM4_GetDDrawDeviceTotalNums ();

Description:

Get the total number of display device that are attached to the desktop.

Return:

If return 0, it indicates that there is only main displayed device in system. If 0, it indicates that there are many video adapters in system but only one is tied to windows desktop. If return other value, it indicates the number of video adapter tied to desktop of system. In the system with many video adapter, user can designate any video adapter as main display device via setting display attribution.

6.94. Assign Display Adapter for the Monitor PlayM4_SetDDrawDevice

BOOL PlayM4_SetDDrawDevice (LONG nPort, DWORD nDeviceNum);

Description:

Assign display adapter for the monitor. Notice: The display region should be set consistently.

Parameters:

nPort

[in] The port number of the player

nDeviceNum

[in] The number of the display device. It ranges from 0 to the return value of PlayM4_GetDDrawDeviceTotalNums. If 0, it means the primary display device.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.95. Assign Display Adapter for Multiple Monitors PlayM4_SetDDrawDevice_EX

BOOL _stdcall PlayM4_SetDDrawDeviceEx (LONG nPort, DWORD nRegionNum, DWORD nDeviceNum);

Description:

Set display adapter used in play window, as 62. It is an added parameter set for PlayM4_SetDisplayRegion.

Parameters:

nPort

[in] The port number of the player

nRegionNum

[in]display region serial No.

[in]The video adapter No.

nDeviceNum

[in] The number of the display device. It ranges from 0 to the return value of PlayM4_GetDDrawDeviceTotalNums. If 0, it means the primary display device.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.96. Get the Display Adapter and Monitor Info PlayM4_GetDDrawDeviceInfo

BOOL PlayM4_GetDDrawDeviceInfo (DWORD nDeviceNum, LPSTR lpDriverDescription, DWORD nDespLen, LPSTR lpDriverName , DWORD nNameLen, HMONITOR *hhMonitor);

Description:

Get the information of the display device and monitor specified by nDeviceNum.

Parameters:

nDeviceNum

[in]The number of the display device. If it is 0, It means the primary display device.

nDespLen

[in]The number of bytes of the lpDriverDescription that has been allocated.

nNameLen

[in] The number of bytes of the lpDriverName that has been allocated.

lpDriverDescription

[out] Address of a string that contains the driver description.

lpDriverName

[out] Address of a string that contains the driver name.

hhMonitor

[out] Handle of the monitor associated with the enumerated DirectDraw object. This parameter is NULL when the enumerated DirectDraw object is for the primary device, a nondisplay device (such as a 3-D accelerator with no 2-D capabilities), or devices not attached to the desktop. For more information, see the function of GetMonitorInfo (Windows API). Notice: the type of HMONITOR is defined in the header file “windef.h” (_WIN32_WINNT >= 0x0500). Please download and install the new Platform sdk. (http: //www.microsoft.com/msdownload/platformsdk/sdkupdate/)

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.97. Get System Info of Display Devices PlayM4_GetCapsEx

```
int   PlayM4_GetCapsEx (DWORD nDDrawDeviceNum);
```

Description:

Get some capabilities of your system.

Parameters:

nDeviceNum

[in]The number of the display device. If it is 0, It means the primary display device.

Return:

SUPPORT_DDRAW

Support DIRECTDRAW. If not, player can’t work.

SUPPORT_BLT

Support BLT operation. If not, player can’t work.

SUPPORT_BLTFOURCC

Display hardware is capable of color-space conversions during blit operations.

SUPPORT_BLTSHRINKX

Supports arbitrary shrinking along the x-axis (horizontally), this flag is valid only for BLT operations.

SUPPORT_BLTSHRINKY

Supports arbitrary shrinking along the y-axis (vertically), this flag is valid only for BLT operations.

SUPPORT_BLTSTRETCHX

Supports arbitrary stretching of a surface along the x-axis (horizontally), this flag is valid only for blit operations.

SUPPORT_BLTSTRETCHY

Supports arbitrary stretching of a surface along the y-axis (vertically), this flag is valid only for blit operations.

SUPPORT_SSE

Supports SSE instruction set, if supports, It will get high performance.

SUPPORT_MMX

Supports MMX instruction set.

Snapshot

6.98. Snapshot Callback PlayM4_SetDisplayCallBack

BOOL PlayM4_SetDisplayCallBack (LONG nPort, void (CALLBACK* DisplayCBFun) (long nPort, char * pBuf, long nSize, long nWidth, long nHeight, long nStamp, long nType, long nReserved));

Description:

Register a callback function for image capturing.

Parameters:

nPort

[in] The port number of the player

DisplayCBFun

[in] Snapshot callback function

Description of the Callback Function:

nPort

The port number of the player

pBuf

Pointer of the snapshot buffer

nSize

Size of the snapshot buffer

nWidth

Width of the image (unit: pixels)

nHeight

Height of the image (unit: pixels)

nStamp

Time stamp (unit: ms)

nType

Received data type: T_YV12, T_RGB32, T_UYVY, please refer to the macro definition of PlayM4_SetDecCallback() for detail information.

nReserved

Reserved;

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

The callback shall return ASAP, as the callback is triggered in clock thread and any time-consuming operation will affect the clock pulse and cause display problems. Users can stop the callback by setting DisplayCDFun as NULL.

This API can be called at any time, and it will remain valid until application ends.

6.99. Snapshot with User Data PlayM4_SetDisplayCallBack

BOOL PlayM4_SetDisplayCallBackEx(LONG nPort,void (CALLBACK* DisplayCBFun)(DISPLAY_INFO

*pstDisplayInfo), long nUser);

Description:

Register a callback function for image capturing, this API is an extended version compared to PlayM4_SetDisplayCallback() which contains user data.

Parameters:

nPort

[in] The port number of the player

DisplayCBFun

[in] Snapshot callback function

nUser

[in] User data

Description of the Callback Function:

nPort

[in] The port number of the player

pstDisplayInfo

Pointer of DISPLAY_INFO structure

Structure Definition:

```
typedef struct
{
    long    nPort;      //The port number of the player
    char * pBuf;        //Pointer of the snapshot buffer
    long    nBufLen;    //Size of the snapshot buffer
    long    nWidth;     // Width of the image (unit: pixels)
    long    nHeight;    // Height of the image (unit: pixels)
    long    nStamp;     // Time stamp (unit: ms)
    long    nType;      //Received data type: T_YV12, T_RGB32, T_UYVY, please refer to the macro definition of PlayM4_SetDecCallback() for detail information.
    long    nUser;      //User Data
}DISPLAY_INFO
```

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

The callback shall return ASAP, as the callback is triggered in clock thread and any time-consuming operation will affect the clock pulse and cause display problems. Users can stop the callback by setting DisplayCDFun as NULL.

This API can be called at any time, and it will remain valid until application ends.

6.100. Convert YV12 Image to BMP File PlayM4_ConvertToBmpFile

BOOL PlayM4_ConvertToBmpFile (char * pBuf, long nSize, long nWidth, long nHeight, long nType, char *sFileName);

Description:

Convert the YV12 image data (from either DecCallback or DisplayCallback) to a BMP file.

Parameters:

pBuf

Pointer of the snapshot buffer

nSize

snapshot size

nWidth

width of the image (unit: pixels)

nHeight

height of the image (unit: pixels)

nType

Received data type: T_YV12, T_RGB32, T_UYVY, please refer to the macro definition of PlayM4_SetDecCallback() for detail information.

sFileName

The BMP file name for saving

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

The YV12-RGB converting process takes CPU resource from PC.

6.101. Convert YV12 Image to JPEG File PlayM4_ConvertToJpegFile

BOOL _stdcall PlayM4_ConvertToJpegFile (char *pBuf, long nSize, long nWidth, long nHeight, long nType, char *sFileName);

Description:

Convert the YV12 image to a jpeg file.

Parameters:

pBuf

Pointer of the snapshot buffer

nSize

snapshot size

nWidth

width of the image (unit: pixels)

nHeight

height of the image (unit: pixels)

nType

Received data type: T_YV12, T_RGB32, T_UYVY, please refer to the macro definition of PlayM4_SetDecCallback() for detail information.

sFileName

The JPEG file name for saving

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

The converting process takes CPU resource of the PC. If the image width or height is not a multiple of 16, the snapshot image resolution will be automatically cropped to multiple of 16. i.e. original image of 176*120 will be cropped to 176*112.

6.102. BMP Snapshot PlayM4_GetBMP

BOOL _stdcall PlayM4_GetBMP (LONG nPort, PBYTE pBitmap, DWORD nBufSize, DWORD*pBmpSize);

Description:

Get a snapshot in BMP format

Parameters:

nPort

[in] The port number of the player

pBitmap

[in] Address assigned by users for storing BMP snapshot, the file size shall be no less then the bmp file size, which is sizeof (BITMAPFILEHEADER) + sizeof (BITMAPINFOHEADER) + w * h * 4, in which w and h stand for the width and height of the image.

nBufSize

[in] Buffer size

pBmpSize

[out] Actual BMP size captured

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.103. JPEG Snapshot PlayM4_GetJPEG

BOOL _stdcall PlayM4_GetJPEG (LONG nPort, PBYTE pJpeg, DWORD nBufSize, DWORD*pJpegSize);

Description:

Get a snapshot in JPEG format

Parameters:

nPort

[in] The port number of the player

pJpeg

[in] [in] Address assigned by users for storing JPEG snapshot, the file size shall be no less then the JPEG file size, suggested value: w * h * 3/2, in which w and h stand for the width and height of the image.

nBufSize

[in] assigned buffer size

pBmpSize

[out]Actual Jpeg image size captured.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

If the image width or height is not a multiple of 16, the snapshot image resolution will be automatically cropped to multiple of 16. i.e. original image of 176*120 will be cropped to 176*112.

6.104. Set JPEG Snapshot Quality PlayM4_SetJpegQuality

```
BOOL _stdcall PlayM4_SetJpegQuality (long nQuality);
```

Description:

Set the quality of JPEG snapshots.

Parameters:

nQuality

[in] the quality of JPEG file, range: from 0<lowest quality> to 100 <highest quality> (80 by default).

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

1. This API shall be called before JPEG snapshot, and is suggested to be called before PlayM4_OpenFile().
2. Suggested quality level: [75, 90].

Others

6.105. DirectDraw Surface Callback PlayM4_RegisterDrawFun

BOOL _stdcall PlayM4_RegisterDrawFun (LONG nPort, void (CALLBACK* DrawFun) (long nPort, HDC hDc, LONG nUser), LONG nUser);

Description:

Register a callback function to get the device context of DirectDraw off-screen surface, and get self- control of the display on this DC.

Parameters:

nPort

[in] The port number of the player

DrawFun

[in] pointer of the callback function

nUser

[in] User data

Description of the Callback Function:

void CALLBACK DrawFun (long nPort, HDC hDc, LONG nUser);

Parameters:

nPort

[out] The port number of the player

hDc

[out] The off-screen surface DC.

nUser

[out] The user data.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

This API is invalid for the overlay surface, users can draw on the window directly under overlay mode and get penetrated via overlay color key.

6.106. DirectDraw Surface Callback PlayM4_RigisterDrawFun

BOOL _stdcall PlayM4_RigisterDrawFun (LONG nPort, void (CALLBACK* DrawFun) (long nPort, HDC hDc, LONG nUser), LONG nUser);

Description:

This API functions the same as 6.105 PlayM4_RegisterDrawFun, and is reserved for downward-compatibility.

Parameters:

nPort

[in] The port number of the player

DrawFun

[in] pointer of the callback function

nUser

[in] User data

Description of the Callback Function:

void CALLBACK DrawFun (long nPort, HDC hDc, LONG nUser);

Parameters:

nPort

[out] The port number of the player

hDc

[out] The off-screen surface DC.

nUser

[out] The user data.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

This API is invalid for the overlay surface. Users can draw on the window directly under overlay mode and get penetrated via overlay color key.

6.107. Set Data Verify Callback PlayM4_SetVerifyCallBack

BOOL _stdcall PlayM4_SetVerifyCallBack (LONG nPort, DWORD nBeginTime, DWORD nEndTime, void (_stdcall* funVerify) (long nPort, FRAME_POS * pFilePos, DWORD bIsVideo, DWORD nUser), DWORD nUser);

Notice:

This API is reserved for future functional expanding and is not valid yet.

Description:

Register a callback function when data verify error is detected. Can be used as watermark or data-loss detect.

Parameters:

nPort

[in] The port number of the player

nBeginTime

verify start time (ms);

nEndTime

verify stop time (ms);

funVerify

the callback function pointer;

nUser

user data.

Description of the Callback Function:

void _stdcall Verify (long nPort, FRAME_POS * pFilePos, DWORD bIsVideo, DWORD nUser);

nPort

port

pFilePos

file position.

bIsVideo

1-video data, 0-audio data

nUser

user data.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

1. This API shall be called before PlayM4_OpenFile().
2. This API shall be registered before file index creating as the verify is executed during indexing process.

6.108. Get Original Frame Callback PlayM4_GetOriginalFrameCallBack

BOOL _stdcall PlayM4_GetOriginalFrameCallBack (LONG nPort, BOOL bIsChange, BOOL bNormalSpeed, long nStartFrameNum, long nStartStamp, long nFileHeader, void (CALLBACK *funGetOrignalFrame) (long nPort, FRAME_TYPE *frameType, long nUser), long nUser);

Notice:

This API is reserved and not valid yet.

Description:

Create callback function to get the original frame data. You can change the time stamp and no. of each frame. The API is used after the file is opened. Used to combine two files.

Parameters:

nPort

[in] The port number of the player

bIsChange

[in] Change the parameters of each frame or not

bNormalSpeed

[in] Get the original frame at normal speed or not

nStartFrameNum

[in] If the user wants to change the original frame number, this is the start frame number of new file.

nStartStamp

[in] If the user wants to change the original frame time stamp, this is the start time stamp of the new file.

nFileHeader

[in] The version information of the file header, if the version is not matched, it will return failure.

Description of callback function:

void (CALLBACK *funGetOrignalFrame) (long nPort, FRAME_TYPE *frameType, long nUser)

nPort:

Channel number;

frameType:

data frame information

```
typedef struct{
    char *pDataBuf;          //the start address of data frame
    long nSize;              //frame size
    long nFrameNum;          //frame number
    BOOL bIsAudio;           //is audio frame or not
long nReserved;
}FRAME_TYPE;
```

nUser:

user data.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.109. Get File Attributes PlayM4_GetFileSpecialAttr

BOOL _stdcall PlayM4_GetFileSpecialAttr (LONG nPort, DWORD *pTimeStamp, DWORD *pFileNum , DWORD *nFileHeader);

Notice:

This API is reserved and not valid yet.

Description:

Get the file last frame number and time stamp. Used after the file is opened and combine with front file.

Parameters:

nPort

[in] The port number of the player

pTimeStamp: [out] the file end time stamp;

pFileNum: [out] the file end frame number;

nfileHeader: [out] the file header information.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.110. Jump to the Next Key Frame on Error PlayM4_PlaySkipErrorData

BOOL PlayM4_PlaySkipErrorData(LONG nport, BOOL bSkip);

Description:

Users can enable this function to avoid blurring or other display problems caused by decoding data error.

Parameters:

nPort

[in] The port number of the player

bSkip

[in]

TRUE: jump to the next key frame if there is error in video data;

FALSE: continue decoding from the next frame if there is error in video data

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Reverse Playback

Notice:

- Reverse playback is an expanded function which is supported from V6.3.0 SDK.
- Valid for HIKVISION baseline devices only
- Reverse playback under 1280*960: key frame interval shall not exceed 100
- Reverse playback above 1280*960: key frame interval shall not exceed 25
- Reverse playback supports up to 2X playback speed.
- Reverse playback under D1 resolution: up to 8X playback speed
- Reverse playback above D1 resolution: up to 2X playback speed
- Invalid for files with error in frame No. or timestamp
- OpenFile mode: call API PlayM4_ReversePlay() to switch between normal/reverse playback mode. The default start position for reverse playback is the start of file.
- OpenStream mode: GOP shall be send reversely to achieve reverse playback.
- OpenStream mode: After sending of the last GOP, which is the end of reverse playback, PlayM4_InputData(port, NULL, -1) shall be called to ensure the decoding of the last GOP.
- Step backward is not supported in stream mode

6.111. Start Reverse Playback PlayM4_ReversePlay

```
BOOL PlayM4_ReversePlay(LONG nPort);
```

Description:

Start reverse playback.

Parameters:

nPort

[in] The port number of the player

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

Notice:

This function shall be called after PlayM4_Play().

6.112. Get Global Timestamp of the Frame PlayM4_GetSystemTime

```
BOOL PlayM4_GetSystemTime(LONG nPort, PLAYM4_SYSTEM_TIME *pstSystemTime);
```

Description:

Get the global timestamp of the current decoding frame.

Parameters:

nPort

[in] The port number of the player

pstSystemTime

[out] Structure PLAYM4_SYSTEM_TIME

```
PLAYM4_SYSTEM_TIME {
    DWORD dwYear;       //year
    DWORD dwMon;        //month
    DWORD dwDay;        //date
    DWORD dwHour;       //hour
    DWORD dwMin;        //minute
    DWORD dwSec;        //second
    DWORD dwMs;         //millisecond
```

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.

6.113. Set the Start Frame of Reverse Stream PlayM4_SetPlayedTimeEx

```
BOOL   PlayM4_SetPlayedTimeEx(LONG nPort,DWORD nTime);
```

Description:

Set the starting frame of reverse playback under OpenStream mode.

Parameters:

nPort

[in] The port number of the player

nTime

[in] The starting frame of reverse playback, which is the relative timestamp compared to the starting I frame in the 1st reverse playback GOP, i.e. nTime = 0 stands for starting from the 1st I frame in the 1st GOP; and nTime = 40 under 25fps encoding resolution stands for starting from the following frame of the 1st I frame (as 40ms is the frame interval under 25fps mode) in the 1st GOP.

Return:

TRUE - API calling succeeds;

FALSE - API calling fails.