

## CONTENTS

|  |    |
|--|----|
| 1.S26X Card Overview .....   | 4  |
| 2.SDK Version Update Section .....                                       | 4  |
| 3.SDK Data type and Data Structure Definition Section .....              | 8  |
| 4.SDK Error Codes .....  | 10 |
| 5.SDK Function Section .....   | 11 |
| 5.1 API Functions Calling Sequence .....                                 | 12 |
| 5.2 Initialize and DeInitialize DSP.....                                 | 15 |
| 5001.    Initialize DSP:InitDSPs() .....                                 | 15 |
| 5002.    DeInitialize DSP:DeInitDSPs().....                              | 15 |
| 5.3 Open and Close Channel.....  | 15 |
| 5003.    Open Channel:ChannelOpen() .....                                | 15 |
| 5004.    Close Channel:ChannelClose() .....                              | 16 |
| 5.4 Get the information of board.....                                    | 16 |
| 5005.    Get total channel number:GetTotalChannels().....                | 16 |
| 5006.    Get total channel number:GetTotalDSPs().....                    | 16 |
| 5007.    Get total board number:GetBoardCount().....                     | 16 |
| 5008.    Get total DSP number:GetDspCount().....                         | 17 |
| 5009.    Get detail info of board:GetBoardDetail() .....                 | 17 |
| 5010.    Get detail info of DSP:GetDspDetail() .....                     | 18 |
| 5011.    Get total encode channel number:GetEncodeChannelCount().....    | 18 |
| 5012.    Get total decode channel number:GetDecodeChannelCount() .....   | 19 |
| 5013.    Get total display channel number:GetDisplayChannelCount() ..... | 19 |
| 5014.    Get the type and serial number of board:GetBoardInfo().....     | 19 |
| 5015.    Get Special Capability of board:GetCapability() .....           | 20 |
| 5.5 Set Video Preview Mode,Start and Stop Video Preview .....            | 20 |
| 5016.    Set Video Preview Mode:SetPreviewOverlayMode().....             | 20 |
| 5017.    Start Video Preview:StartVideoPreview() .....                   | 21 |
| 5018.    Stop Video Preview:StopVideoPreview().....                      | 21 |
| 5.6 Set and Get Video Parameters.....                                    | 22 |
| 5019.    Set Video Parameters:SetVideoPara().....                        | 22 |
| 5020.    Get Video Parameters:GetVideoPara() .....                       | 22 |
| 5.7 Get SDK Infomation .....   | 23 |
| 5021.    Get SDK Version:GetSDKVersion() .....                           | 23 |
| 5022.    Get Last Error:GetLastErrorNum() .....                          | 23 |
| 5.8 Set and Get Encode Stream Type.....                                  | 23 |
| 5023.    Set Encode Stream Type on Main Channel:SetStreamType() .....    | 23 |
| 5024.    Get Encode Stream Type on Main Channel:GetStreamType() .....    | 24 |
| 5025.    Set Encode Stream Type on Sub Channel:SetSubStreamType () ..... | 24 |
| 5026.    Get Encode Stream Type on Sub Channel:GetSubStreamType () ..... | 24 |
| 5.9 Start and Stop Video Capture.....                                    | 25 |
| 5027.    Start Video Capture on Main Channel:StartVideoCapture().....    | 25 |
| 5028.    Stop Video Capture on Main Channel:StopVideoCapture() .....     | 25 |
| 5029.    Start Video Capture on Sub Channel:StartSubVideoCapture() ..... | 25 |

|       |  |    |
|-------|--|----|
| 5030. | Stop Video Capture on Sub Channel:StopSubVideoCapture() .....                    | 26 |
| 5.10  | Read Encode Stream Data.....   | 26 |
| 5031. | Register Stream Direct Read Callback:RegisterStreamDirectReadCallback()26        |    |
| 5032. | Setup Message Notify:SetupNotifyThreshold() .....                                | 26 |
| 5033. | Register Message Notify:RegisterMessageNotifyHandle() .....                      | 27 |
| 5034. | Read encode video and audio stream data:ReadStreamData() .....                   | 27 |
| 5035. | Another Register Stream Read CallBack:RegisterStreamReadCallback().....          | 28 |
| 5.11  | Set encode video quality ,frame structure and frame rate .....                   | 28 |
| 5036. | Set encode video quality:SetDefaultQuant() .....                                 | 28 |
| 5037. | Set Encode Frame Structure and Frame Rate:SetIBPMode() .....                     | 28 |
| 5.12  | Set Encode Resolution .....  | 29 |
| 5038. | Set Encode Resolution on Main Channel:SetEncoderPictureFormat() .....            | 29 |
| 5039. | Set Encode Resolution on Sub Channel:SetSubEncoderPictureFormat() .....          | 29 |
| 5.13  | Set Bit Rate and Bit Rate Control Mode .....                                     | 30 |
| 5040. | Set Max Bit Rate:SetupBitrateControl() .....                                     | 30 |
| 5041. | Set Bit Rate Control Mode:SetBitrateControlMode() .....                          | 30 |
| 5.14  | Set Overlay Color and Restore Overlay Surface.....                               | 31 |
| 5042. | Set Overlay Color:SetOverlayColorKey() .....                                     | 31 |
| 5043. | Restore Overlay Surface:RestoreOverlay().....                                    | 31 |
| 5.15  | Set and Get video input standard,status,adjust the position of video input.....  | 31 |
| 5044. | Set Video Standard:SetVideoStandard().....                                       | 31 |
| 5045. | Set Default Video Standard:SetDefaultVideoStandard() .....                       | 32 |
| 5046. | Set Video Signal Detect Precision:SetVideoDetectPrecision() .....                | 32 |
| 5047. | Check Video Signal Input:GetVideoSignal() .....                                  | 32 |
| 5048. | Set Input Video Position :SetInputVideoPosition() .....                          | 33 |
| 5.16  | Set OSD,LOGO and Mask.....   | 33 |
| 5049. | Set OSD Display Mode:SetOsdDisplayMode() .....                                   | 33 |
| 5050. | Set OSD Display Mode(extended):SetOsdDisplayModeEx().....                        | 34 |
| 5051. | Set OSD Enabled or Disabled:SetOsd() .....                                       | 35 |
| 5052. | Set OSD Time(For Checking Time):SetupDateTime() .....                            | 36 |
| 5053. | Comvert 24bit BMP File to YUV422:LoadYUVFromBmpFile() .....                      | 36 |
| 5054. | Setup Logo:SetLogo() .....   | 36 |
| 5055. | Set LOGO Display Mode:SetLogoDisplayMode() .....                                 | 37 |
| 5056. | Stop LOGO Display:StopLogo().....  | 37 |
| 5057. | Set Mask:SetupMask() .....   | 37 |
| 5058. | Stop Mask:StopMask().....  | 38 |
| 5.17  | The draw callback function when the video is previewed with Offscreen mode ..... | 38 |
| 5059. | Register Draw callback function:RegisterDrawFun() .....                          | 38 |
| 5060. | Stop Register Draw Function:StopRegisterDrawFun() .....                          | 39 |
| 5.18  | Motion Detection .....   | 39 |
| 5061. | Setup Motion Detect Precesion:AdjustMotionDetectPrecision().....                 | 39 |
| 5062. | Setup Motion Detect Region and Numbers:SetupMotionDetection().....               | 40 |
| 5063. | Start Motion Detect:StartMotionDetection().....                                  | 40 |
| 5064. | Analyze Motion Frame:MotionAnalyzer() .....                                      | 40 |

|       |  |    |
|-------|--|----|
| 5065. | Stop Motion Detect:StopMotionDetection() .....   | 41 |
| 5066. | Setup Motion Detection (extended):SetupMotionDetectionEx ().....                                   | 41 |
| 5.19  | Set Live Audio Monitor and Get Live Audio Level.....   | 42 |
| 5067. | Set Live Audio Monitor:SetAudioPreview().....  | 42 |
| 5068. | Get Live Audio Level:GetSoundLevel() .....   | 43 |
| 5.20  | Start and Stop Getting Original Uncompressed Video Stream Data .....                               | 43 |
| 5069. | Register callback function of get original uncompressed video stream :.....                        | 43 |
|       | RegisterImageStreamCallback() .....  | 43 |
| 5070. | Start and Stop getting original uncompressed video stream:SetImageStream()<br>43                   |    |
| 5.21  | Get Original Image and Save as BMP File .....  | 44 |
| 5071. | Get Original Image :GetOriginalImage() .....   | 44 |
| 5072. | Save as BMP Files:SaveYUVToBmpFile() .....   | 44 |
| 5073. | Capture JPEG picture:GetJpegImage () .....   | 45 |
| 5.22  | Dual Channel Encode.....   | 45 |
| 5074. | Switch Between Main Channel and Sub Channel:SetupSubChannel().....                                 | 45 |
| 5075. | Get the stream type of sub channel :GetSubChannelStreamType() .....                                | 46 |
| 5.23  | Get Frame Statistics .....   | 47 |
| 5076. | Get Frame Statistics:GetFramesStatistics() .....   | 47 |
| 5.24  | Capture I Frame .....  | 47 |
| 5077. | Capture I frame:CaptureIFrame().....   | 47 |
| 5.25  | Setup DeInterlace .....  | 47 |
| 5078. | Set DeInterlace:SetDeInterlace().....  | 47 |
| 5.26  | Reset DSP .....  | 48 |
| 5079. | Reset DSP:ResetDSP ().....   | 48 |
| 5080. | Set Watch Dog:SetWatchDog ().....  | 48 |
| 5.27  | DECODE Card:Set display standard of video output .....   | 49 |
| 5081. | Set display standard of video output:SetDisplayStandard() .....                                    | 49 |
| 5.28  | DECODECard,Set,Change,Fill,ClearDisplay Region .....   | 49 |
| 5082. | Set the total number and parameter of display region:SetDisplayRegion() ....                       | 49 |
| 5083. | Set Display Region Position:SetDisplayRegionPosition().....  | 50 |
| 5084. | Fill Display Region with pictures:FillDisplayRegion() .....  | 50 |
| 5085. | Clear Display Region :ClearDisplayRegion() .....   | 51 |
| 5.29  | DECODE Card:Set encode video to extended output(matrix output).....                                | 51 |
| 5086. | Set encode video to extended output:SetEncoderVideoExtOutput().....                                | 51 |
| 5.30  | DECODE Card:Set decode audio/video output .....  | 52 |
| 5087. | Set Decoder Audio Output:SetDecoderAudioOutput() .....   | 52 |
| 5088. | Set the video output of decode channel(internal output on<br>Decode):SetDecoderVideoOutput() ..... | 52 |
| 5089. | Set external video output of decode channel (matrix<br>output):SetDecoderVideoExtOutput().....     | 53 |

## 1.S26X Card Overview

S26X video and audio compression card is a special production, which is designed for digital surveillance market. It uses high-performance Video compression of H.264 standard with OggVorbis Audio coding algorithm to accurately achieve video and audio Real-time coding (4CIF 25 f/s PAL or 30 f/s NTSC) based on hardware completely. It also has the function such as dynamic bit rate, controllable frame rate, frame mode, dynamic image quality control, and real-time audio preview and alarming on Video signal loss, and can adjust any channel's parameters independently with stable and reliable performance. Compared with MPEG-I products, it can greatly save storage space and more suitable for broadband or narrowband network transmission with the same image quality, so it is one of the best choices for digital surveillance products.

The SDK of S26X series card is made up of encode system SDK, network SDK and player SDK. This manual especially describes encode system SDK, as to the other SDK you can refer to the relevant documents. Encode system SDK is the local record software interface program, which is designed for one or multiple channel boards of this series, to provide for application developers in the form of dynamic link library. It also has Demo ( H.264 Demo) and corresponding source code, which can effectively decrease the period of development applications.

When using, software developer should especially notice that they can modify all the parameters like resolution, stream code, frame structure except the stream code (complex stream, video stream). Namely, it can transform frame rate (SetIBPMode(...)) and quantization coefficient(SetDefaultQuant) in the course of compression, while no need of stopping or starting compression but still within a file record. The player can automatically identify parameters such as frame rate and can play normally according to current compressed frame rate.

Compressed bit rate can be controlled by dynamically modifying the quantization coefficient(I, B, P). If the bit rate is too high, increase the coefficient; whereas, decrease it. Certainly, the coefficient doesn't need to be decreased if enough.

Motion detection of S26X series compression card is independent from compression. It can be done without compression. It is valuable that the frame rate can be transformed. When motion happened, record at high frame rate (25 F/S); whereas, record at low frame rate. Recording in the same file can greatly save hard disk space.

## 2.SDK Version Update Section

## 5.1 API Functions Calling Sequence

A.

|                            |                                  |
|----------------------------|----------------------------------|
| Set Default Video Standard | <b>SetDefaultVideoStandard()</b> |
|----------------------------|----------------------------------|

B.

|                |                   |
|----------------|-------------------|
| Initialize DSP | <b>InitDSPs()</b> |
|----------------|-------------------|

C.

|   |   |
|---|---|
| Get total encode channels   | <b>GetTotalChannels()</b>                 |
| Open Channel  | <b>ChannelOpen()</b>                      |
| Register Draw Function  | <b>RegisterDrawFun()</b>                  |
| Register Encode(compressed) stream data direct read callback function | <b>RegisterStreamDirectReadCallback()</b> |
| Register Original uncompressed video stream data callback function    | <b>RegisterImageStreamCallback()</b>      |
| Set Overlay Color   | <b>SetOverlayColorKey()</b>               |

D.

|                        |                                 |
|------------------------|---------------------------------|
| Set video preview mode | <b>SetPreviewOverlayMode ()</b> |
| Start video preview    | <b>StartVideoPreview ()</b>     |

E.

|   |                               |
|---|-------------------------------|
| //Set OSD   |                               |
| Set OSD display mode (This API supports 2 row OSD display)  | <b>SetOsdDisplayMode()</b>    |
| Set OSD display mode(This API supports 8 rows OSD display ) | <b>SetOsdDisplayModeEx ()</b> |
| Set OSD Display   | <b>SetOsd()</b>               |
| //Set Logo  |                               |
| Convert 24bit bmp file to YUV data                          | <b>LoadYUVFromBmpFile()</b>   |
| Set LOGO Display Mode                                       | <b>SetLogoDisplayMode()</b>   |
| Set LOGO Display  | <b>SetLogo()</b>              |
| //Set Mask  |                               |
| Set Mask  | <b>SetupMask()</b>            |

F.

|  |                                  |
|--|----------------------------------|
| Set encode resolution of main channel  | <b>SetEncoderPictureFormat()</b> |
| Set encode stream type of main channel | <b>SetStreamType()</b>           |

|   |                                |
|---|--------------------------------|
| Set encode video quality  | <b>SetDefaultQuant()</b>       |
| Set encode frame structure and frame rate                       | <b>SetIBPMode()</b>            |
| Set encode max bit rate   | <b>SetupBitrateControl()</b>   |
| Set encode bit rate control mode                                | <b>SetBitrateControlMode()</b> |
| Set video parameters(brightness, contrast, saturation and hue ) | <b>SetVideoPara()</b>          |

**G. Motion Detection Mode 1**

|                                |                                      |
|--------------------------------|--------------------------------------|
| Set Motion Detection Precision | <b>AdjustMotionDetectPrecision()</b> |
| Set Motion Detection areas     | <b>SetupMotionDetection()</b>        |
| Start Motion Detection         | <b>StartMotionDetection()</b>        |
| Analyze Motion Detect frame    | <b>MotionAnalyzer()</b>              |

## Motion Detection Mode 2

|                        |                                 |
|------------------------|---------------------------------|
| Set Motion Detection   | <b>SetupMotionDetectionEx()</b> |
| Start Motion Detection | <b>StartMotionDetection()</b>   |

**H. Capture an frame of picture**

|                                     |                           |
|-------------------------------------|---------------------------|
| Get an frame of original image      | <b>GetOriginalImage()</b> |
| Save the original image to BMP file | <b>SaveYUVToBmpFile()</b> |
| Get an frame of JPEG image          | <b>GetJpegImage()</b>     |

**I. Get sound level and monitor the live audio**

|                        |                          |
|------------------------|--------------------------|
| Get sound level        | <b>GetSoundLevel()</b>   |
| Monitor the live audio | <b>SetAudioPreview()</b> |

**J. Get the info of video, sdk and board**

|                                      |                              |
|--------------------------------------|------------------------------|
| Signal loss detection                | <b>GetVideoSignal()</b>      |
| Get SDK version                      | <b>GetSDKVersion()</b>       |
| Get Video parameters                 | <b>GetVideoPara()</b>        |
| Get the model and serial No of board | <b>GetBoardInfo()</b>        |
| Get frame statistics                 | <b>GetFramesStatistics()</b> |
| Get board detail                     | <b>GetBoardDetail()</b>      |
| Get dsp detail                       | <b>GetDspDetail()</b>        |

**K. Start video& audio capture (encode compressed data)**

|                               |                            |
|-------------------------------|----------------------------|
| Start capture of main channel | <b>StartVideoCapture()</b> |
|-------------------------------|----------------------------|

**L. Start capture of uncompressed video data**

|   |                         |
|---|-------------------------|
| Start Original uncompressed video capture | <b>SetImageStream()</b> |
|---|-------------------------|

**M. the parameters setting for sub channel, start video& audio capture of sub channel**

|                                       |                                     |
|---------------------------------------|-------------------------------------|
| Set encode stream type of sub channel | <b>SetSubStreamType ()</b>          |
| Set encode resolution of sub channel  | <b>SetSubEncoderPictureFormat()</b> |

|   |                                |
|---|--------------------------------|
| Switch to sub channel                     | <b>SetupSubChannel(, 1)</b>    |
| Set encode video quality                  | <b>SetDefaultQuant()</b>       |
| Set encode frame structure and frame rate | <b>SetIBPMode()</b>            |
| Set encode max bit rate                   | <b>SetupBitrateControl()</b>   |
| Set encode bit rate control mode          | <b>SetBitrateControlMode()</b> |
| Switch to main channel                    | <b>SetupSubChannel(, 0)</b>    |
| Start video& audio capture of sub channel | <b>StartSubVideoCapture()</b>  |

**N.Exit**

|   |                              |
|---|------------------------------|
| Stop Register Draw function                   | <b>StopRegisterDrawFun()</b> |
| Stop getting original uncompressed video data | <b>SetImageStream()</b>      |
| Stop Motion detection                         | <b>StopMotionDetection()</b> |
| Stop video& audio capture of main channel     | <b>StopVideoCapture()</b>    |
| Stop video& audio capture of sub channel      | <b>StopSubVideoCapture()</b> |
| Stop video preview                            | <b>StopVideoPreview()</b>    |
| Channel Close                                 | <b>ChannelClose()</b>        |
| DeInitialize DSP                              | <b>DeInitDSPs()</b>          |