SVOGenerator Interprocess Communication Software Specification

Ver 1.1

NetVision Co., Ltd.

Update History

Revision	Date	Note	
1.0	Sep 8, 2023	New File (Translation of Japanese edition ver.1.70)	R.Sugo
1.1	Mar 29, 2024	Add bellow contents; "WM_SVO_GET_CURRENT_FRAME" "WM_SVO_GET_REG_VALUE" "ID_SVO_OPTION_SETTING" ROW information for Communication "ROW_INFO_STRUCT" (Translation of Japanese edition ver.1.91)	R.Sugo

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1. Overview

Interprocess communication using window messages allows you to operate the SVOGenerator with external applications. This document describes the window message details and program examples supported by SVOGenerator.

"NVFilePlayer" also tentatively supports the same window messages as below.

2. Constant Definition

```
#define ID_SVO_FILE_OPEN 100
#define ID_SVO_DEVICE_SETTING 102
#define ID_SVO_OPTION_SETTING 103
#define WM_SVO_BOARD_OPEN (WM_APP + 101)
#define WM_SVO_CONTROL_SHOW (WM_APP + 110)
#define WM_SVO_CONTROL_CLOSE (WM_APP + 111)
#define WM_SVO_CONTROL_PLAY (WM_APP + 112)
#define WM_SVO_CONTROL_STOP (WM_APP + 113)
#define WM_SVO_CONTROL_SETCHECKBOX (WM_APP + 114)
#define WM_SVO_CHECK_OUTPUT_SIGNAL (WM_APP + 115)
#define WM_SVO_SET_PLAY_RANGE (WM_APP + 116)
#define WM_SVO_GET_BOARD_ID (WM_APP + 117)
#define WM_SVO_GET_FRAME_LENGTH (WM_APP + 118)
#define WM_SVO_SET_EXTERNAL_WINDOW (WM_APP + 119)
#define WM_SVO_GET_CURRENT_FRAME (WM_APP + 120)
#define WM_SVO_GET_REG_VALUE (WM_APP + 121)
```

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3. Window Message Specification

An external application program acquires the SVOGenerator window handle and sends the following message to that window to operate the SVOGenerator.

3.1. Open Video File

message	WM_COPYDATA
wParam	(HWND) Specify the source window handle.
lParam	(COPYDATASTRUCT*) Specify the address of COPYDATASTRUCT structure. COPYDATASTRUCT structure member dwData: ID_SVO_FILE_OPEN cbData: Specify the size (including the final character) of the string specified by lpData. lpData: (const char*) Specify the string pointing to the file name of the video file to open.
Return Value	0: Success Other than 0: Failure
Notes	Be sure to close the control dialog before send this message. Please specify the file name with the full path.

3.2. Open the SVO Board (Device Select)

message	WM_SVO_BOARD_OPEN
wParam	Specify 0
lParam	Specify the board ID (0-15) of the board to open. If you specify a value less than 0 or over 16, open the first hit device.
Return Value	0: Success Other than 0: Failure
Notes	Be sure to close the control dialog before send this message.

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3.3. SVO Board Setting (Device Setting)

message	WM_COPYDATA
wParam	(HWND) Specify the source window handle.
lParam	(COPYDATASTRUCT*) Specify the address of COPYDATASTRUCT structure. COPYDATASTRUCT structure member dwData: ID_SVO_DEVICE_SETTING cbData: Specify the size (including the NULL) of the string specified by lpData. lpData: (const char*) Specify the string pointing to the file name of the setting file to open. Specify 0 for cbData and lpData when inheriting the previous settings without using a setting file.
Return Value	0: Success Other than 0: Failure
Notes	Be sure to close the control dialog before send this message. Please specify the file name with a full path.

3.4. Open the Control Dialog (Device Control)

message	WM_SVO_CONTROL_SHOW
wParam	Specify 0.
lParam	Specify 0.
Return Value	0: Success Other than 0: Failure
Notes	This message cannot be sent before setting the SVO board (Device Setting). In order to send the settings to the board after opening the control dialog, put a 1 second wait before sending the next command.

3.5. Close the Control Dialog (Device Control)

message	WM_SVO_CONTROL_CLOSE
wParam	Specify 0.
lParam	Specify 0.
Return Value	0: Success Other than 0: Failure 1: Device is processing. (Retry after 500ms or more.)
Notes	-

3.6. Start Video Output

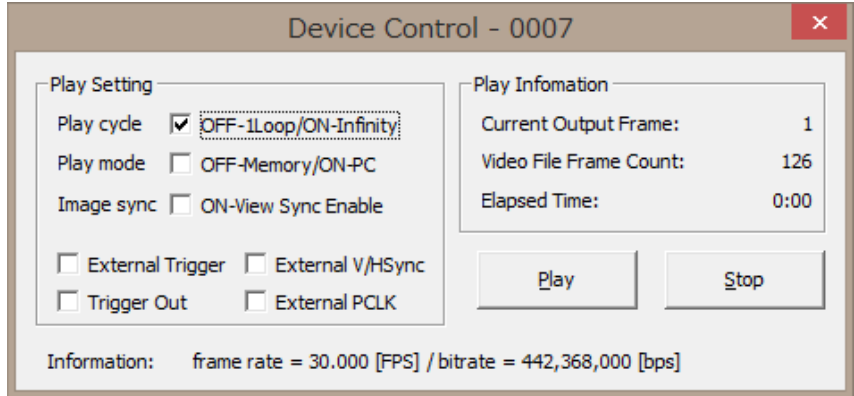| message	WM_SVO_CONTROL_PLAY
wParam	Specify 0.
lParam	Specify 0.
Return Value	0: Success Other than 0: Failure 1: Device is processing. (Retry after 500ms or more.)
Notes	Be sure to open the control dialog before send this message.

3.7. Stop Video Output

message	WM_SVO_CONTROL_STOP
wParam	Specify 0.
lParam	Specify 0.
Return Value	0: Success Other than 0: Failure 1: Device is processing. (Retry after 500ms or more.)
Notes	Be sure to open the control dialog before send this message.

3.8. Change the Settings in the Control Dialog

message	WM_SVO_CONTROL_SETCHECKBOX
wParam	Specify the number of checkboxes to be set. 0: Play cycle 1: Play mode 2: Image sync 3: External Trigger 4: External V/HSnc 5: Trigger Out 6: External PCLK
lParam	Specify either one of the BST_CHECKED or BST_UNCHECKED.
Return Value	0: Success Other than 0: Failure 1: Device is processing. (Retry after 500ms or more.)
Notes	Be sure to open the control dialog before send this message.

3.9. Specify the Playback Range

message	WM_SVO_SET_PLAY_RANGE
wParam	Specify 0.
lParam	Specify (b31-b16) (end frame + 1) Specify (b15-b0) start frame For example, if you want to output only the first frame, specify 0x00010000.
Return Value	0: Success

	Other than 0: Failure
Notes	Specify the range of frames to be played among the frames transferred to DRAM.
	This is valid only in DRAM transfer mode (Play mode is not checked). Operation in other cases is indefinite.
	Video data is transferred to DRAM when the Control dialog is created. This message specifies the playback range of DRAM after video data transfer.
	It takes approximately 200ms to perform one setting process.
	Once this message is sent, the playback range is retained until the next time this message is received.
	When switching from specifying a playback range to playing all frames, specify 0 for lParam and invoke WM_SVO_SET_PLAY_RANGE, then perform the playback process (Stop->Play) again.
	If video output has started, wait for the next frame to be transferred before making settings. If the external sync wait state continues without FSYNC input even though the external sync is enabled, this function fails because the transfer of the next frame times out. In this case, please stop the video output and perform this setting.

3.10. Get the Opened SVO Board ID

message	WM_SVO_GET_BOARD_ID
wParam	Specify 0.
lParam	Specify 0.
Return Value	0-15: Return opened SVO board ID
	16: Board is not opened
	Others: Failure
Notes	-

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3.11. Specify the Window Handle to be Notified When the State of the SVOGenerator Changes.

message	WM_SVO_SET_EXTERNAL_WINDOW
wParam	(HWND) hWnd Specify the source window handle.
lParam	Specify 0.
Return Value	0: Success Other than 0: Failure
Notes	When this function is called, the window specified by wParam is notified according to the operation of SVOGenerator. If 0 is specified for wParam, the function of notifying external windows is disabled. When the window with the window handle specified in wParam is terminated, please send this window message with wParam = 0 before exiting. Currently, the notification function is not yet implemented.

3.12. Get the Number of Frames

message	WM_SVO_GET_FRAME_LENGTH
wParam	Specify 0.
lParam	Specify 0.
Return Value	Return the total number of frames in the open file. 0: Failure
Notes	-

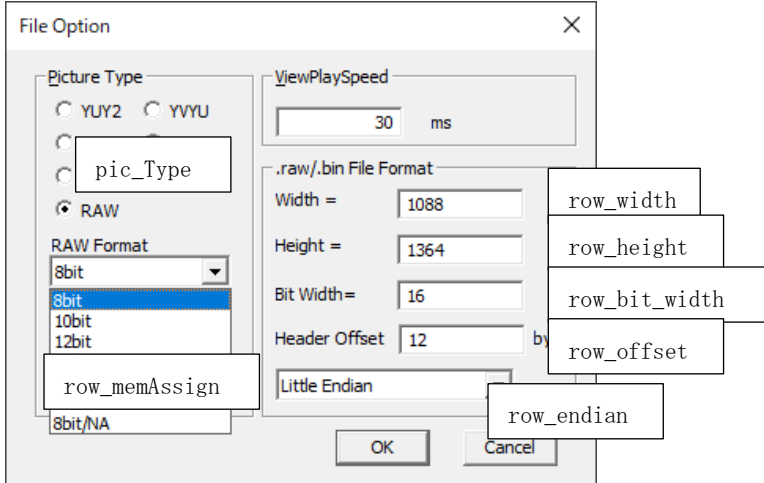### 3.13. Get the Number of the Frame Being Output

message	WM_SVO_GET_CURRENT_FRAME
wParam	Specify 0.
lParam	Specify 0.
Return Value	Return the number of the frame being output. Return 0 if the frame number cannot be obtained.
Notes	Be sure to open the control dialog before send this message. Return the total number of the outputting or waiting-to-output frames, starting from the first output frame as frame 1.

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3.14. Check the Values Written to the FPGA Registers on the SVO Board

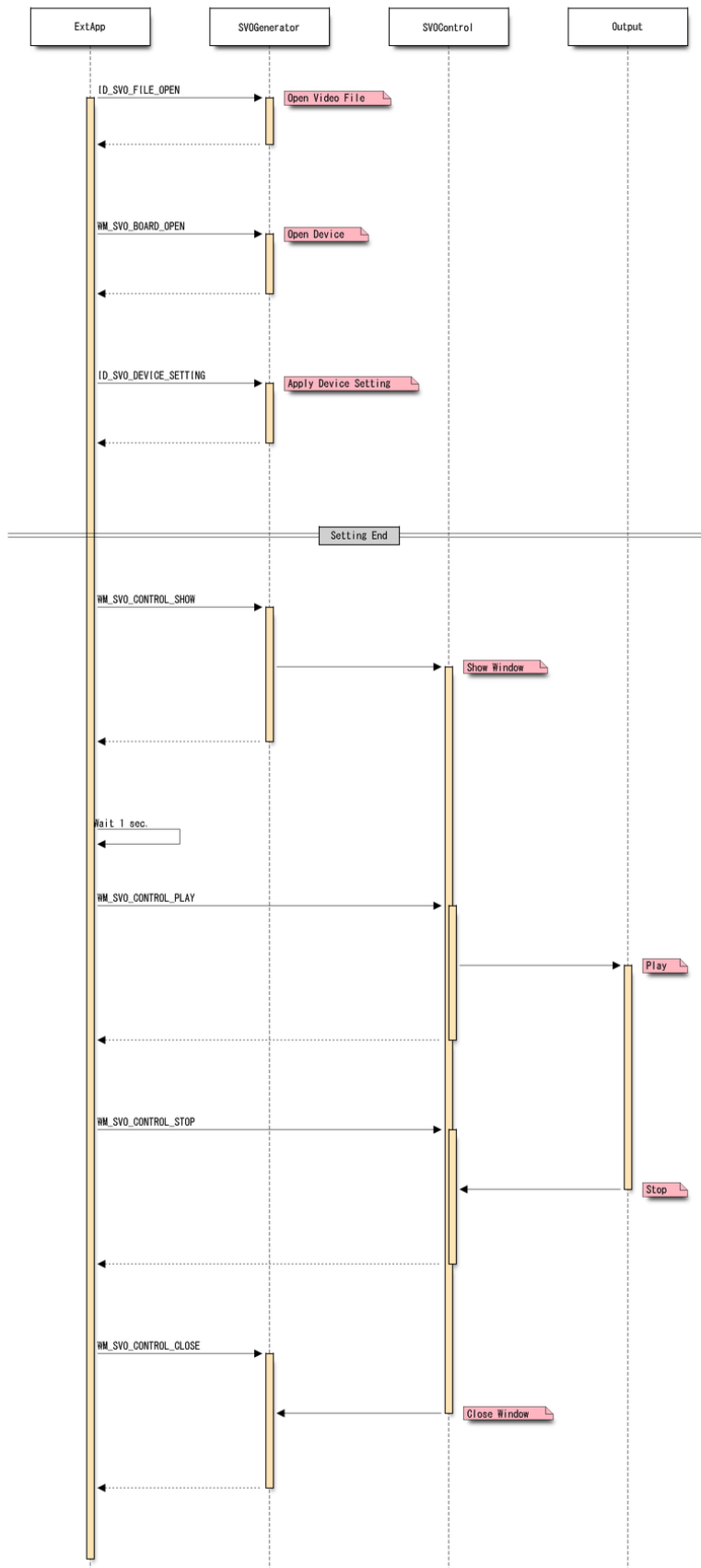| message	WM_SVO_GET_REG_VALUE
wParam	(HWND) Specify the register number of FPGA on SVO board
lParam	Specify 0.
Return Value	Return the value currently written to the FPGA register.

3.15. ROW Information Settings

message	WM_COPYDATA
wParam	(HWND) Specify the window handle of source.
lParam	(COPYDATASTRUCT*) Specify the address of COPYDATASTRUCT structure. COPYDATASTRUCT structure member dwData: ID_SVO_OPTION_SETTING cbData: Specify the size of the structure（ROW_INFO_STRUCT）specified by lpData. lpData: Specify the pointer of ROW_INFO_STRUCT.

	/// ROW information
	typedef struct
	{
	    int pic_Type; // image type
	    int row_memAssign; // memory assignment (0-N)
	    int row_width; // width
	    int row_height; // height
	    int row_bit_width; // bit width
	    int row_endian; // endian (0:Big 1:Little)
	    int row_offset; // file offset value
	} ROW_INFO_STRUCT, *PROW_INFO_STRUCT;

※Structure alignment must be 1 byte.

Return Value	0: Success
	Other than 0: Failure
Notes	Be sure to close the control dialog and the File Option dialog before send this message.

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Operation Procedure

The following is an example of externally controlling SVOGenerator playback.

(1) Start SVOGenerator in advance

(2) Open the video file

(3) Open the SVO board (Device Select)

(4) Set the SVO board (Device Setting)

(5) Open the control dialog

(6) Add 1 second wait

(7) Start video output

ExtApp	SVOGenerator	SVOControl	Output

ID_SVO_FILE_OPEN

Open Video File

WM_SVO_BOARD_OPEN

Open Device

ID_SVO_DEVICE_SETTING

Apply Device Setting

Setting End

WM_SVO_CONTROL_SHOW

Show Window

Wait 1 sec.

WM_SVO_CONTROL_PLAY

Play

WM_SVO_CONTROL_STOP

Stop

WM_SVO_CONTROL_CLOSE

Close Window

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4. Obtain the Window Handle

Please use the FindWindow function or EnumWindows function to obtain the window handle of SVOGenerator and NVFilePlayer.

The window class name of SVOGenerator is "SVOGenerator". However, in the case of SVOGenerator that does not support this function, it has a different class name.

The window class name of NVFilePlayer is "NVFilePlayer".

5. Others

If you do not want to display the SVOGenerator window, open SVOGenerator with the -quiet option.

6. Code Example

```
// Get window
HWND hWnd = ::FindWindowA("SVOGenerator", NULL);
if(hWnd)
{
        int ret;

        // Open file
        const char filename[] = {"C:¥¥temp.avi"};
        COPYDATASTRUCT data;
        data.dwData = ID_SVO_FILE_OPEN;
        data.cbData = strlen(filename)+1;
        data.lpData = (PVOID)filename;
        ret = ::SendMessageA(hWnd, WM_COPYDATA, (WPARAM)m_hWnd, (LPARAM)&data);
        if(ret){
                ::MessageBoxA(NULL, "Failed to open file.", "Error", MB_OK);
        }
}
```

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7. Sample Software (SVOGenExtCtl)

There is a sample project for external control of SVOGenerator by using this interprocess communication.

SVOGenerator External Control Sample Software

Start SVOGenerator in advance

Operating procedure

Specify the video file

Specify the device ID
(-1 for automatic)

Specify the setting file (.svo)
(When you use the previous setting, this field is blank)

Perform everything from file open to video output at once