

SVM-03/03U Utility Software

[SVMCtl]

Software Manual

Rev. 8.1

NetVision Co., Ltd

Revision History

Edition	Date	Detail	Charge
1st	2014/06/25	The first edition	N. Kashiwagi
2nd	2015/05/12	Change 「【Figure 4】Setting Window of SVMCtl」	N. Kashiwagi
3rd	2015/05/27	Integrate SVM-03 / SVM-03U	H. Yamada
4th	2015/06/16	Change UI placement	H. Yamada
5th	2015/08/12	Change UI placement、add function	H. Yamada
6th	2015/10/07	Add function explanation	H. Yamada
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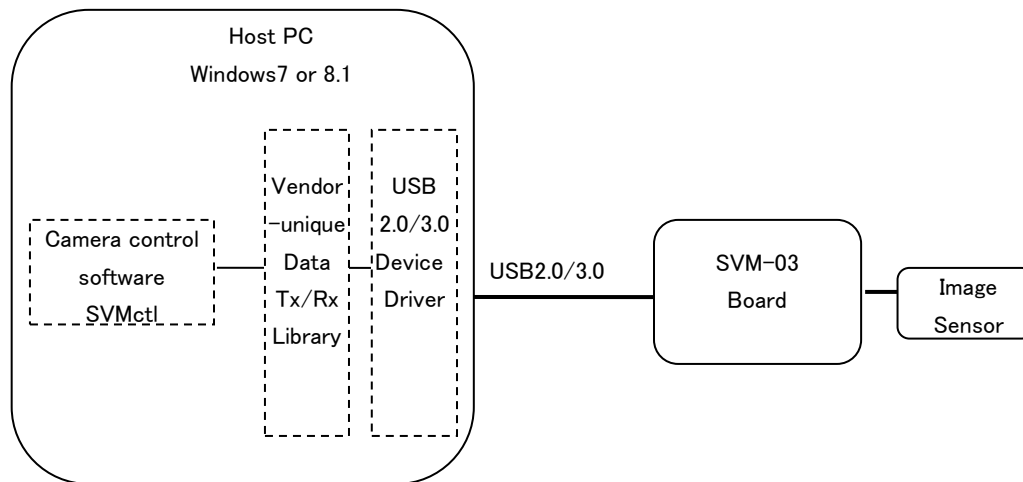
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1. Outline

This document is a manual of SVM-03 utility software “SVMCtl”. SVM-03 is an image converter / capture board from parallel digital interface to HDMI or USB3.0. “SVMCtl” is a utility software to configure SVM-03 and to send setting into the image sensor. **When you use SVM-03 board at the first time, you need to configure initialization by “SVMCtl” software.**

For hardware details about SVM-03, please refer to the hardware specification sheet.

【Figure 1】 System Configuration



※Win7, Win8 is 32bit, 64bit both supported.

【Table 1】 SVM System Constitution Table

Application	Utility Software	SVMCtl (SVMCtl.exe)
Driver	32bit driver	
	64bit driver	
Firmware	Board controller	SVM-03 board USB chip control FW (SVM-03_vxx.img)
Hardware	SVM board	SVM-03 board
	FPGA configuration	FPGA configuration data (s6fpgaxxx.bin)

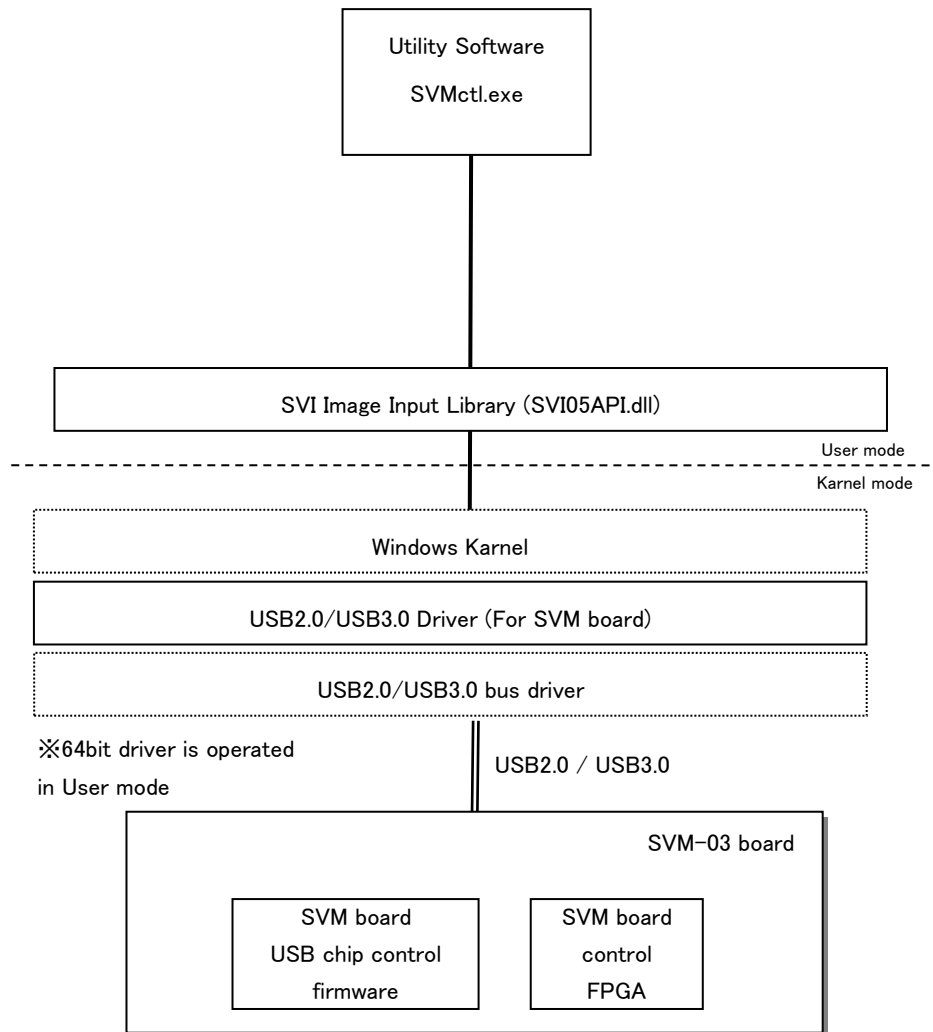
– xxx shows the version number.

2. SVM-03 Software Configuration

Software configuration of SVMctl is described in 【Figure2】.

【Figure 2】 Software Configuration

Windows 7 or 8



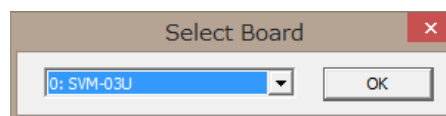
3. Usage of SVMctl

SVMctl software can configure setting of camera via I2C interface, acquire information of camera and configure board setting such as input resolution and pixel format. You can also update the firmware and FPGA configuration by SVMctl. The latest firmware image would be uploaded in our web page.

3.1. Top Window

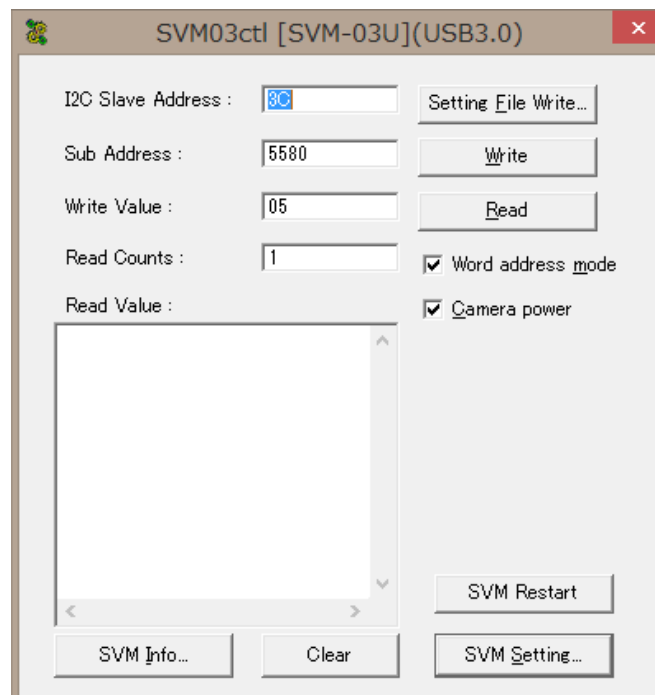
When software is started if the number of the SVM boards connected is one, top window will be displayed. If two or more SVM boards are connected, Select Board dialog as shown in [Fig. 3] is displayed.

【Figure 3】Select Board Dialog



This software provides menu items depending on a model number of automatically recognized like SVM-03 or SVM-03U. Recognized board identifier and version of USB (USB2.0 / USB3.0) are displayed on title bar, as shown in [Fig.4]. USB3.0 connection becomes indispensable to high-resolution non-compression image transfer concerning a transfer speed. **Please confirm that it is displayed as "USB3.0" on the title bar of top window when you use camera of resolution more than 720p with SVM-03U.**

【Figure 4】Top Window of SVMctl



Lists of Menu on top window of SVMCtl are showed on Table2.

【Table 2】SVMCtl Top Window Menu Chart

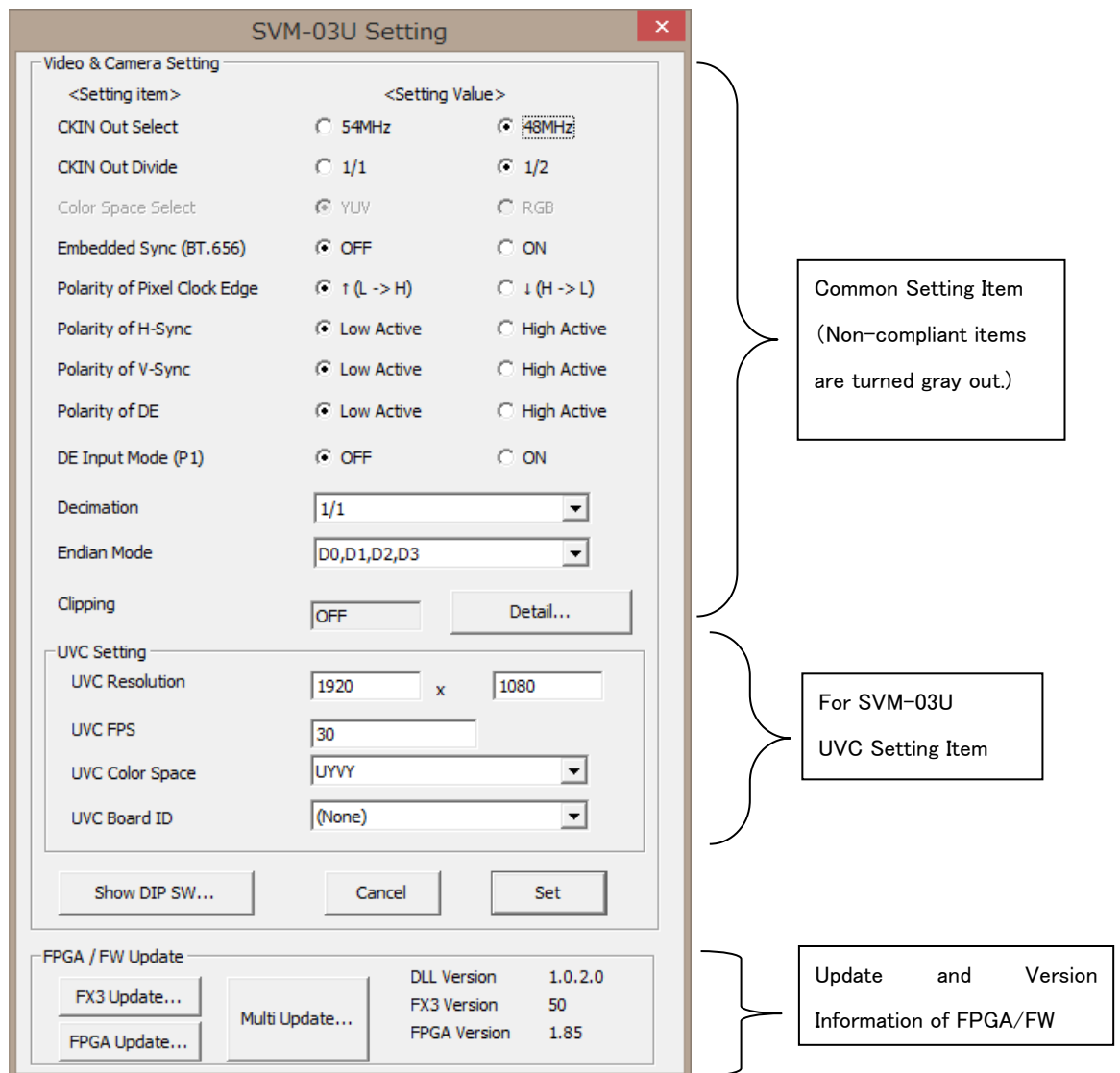
I2C Slave Address	Specifies the slave address (7bit) of camera by hexadecimal.
Sub Address	Set register address in hexadecimal representation (8 bit). If “Word address mode” is checked, SVM-03 transmits the length of the address in word long (16bit).
Write Value	Set value to transmit in hexadecimal representation. If it is blank, SVM-03 doesn't transmit. And SVM-03 can transmit plural bytes by delimited comma.
Read Counts	Set the number of bytes to read from Sub Address.
Read Value	Display comma delimited values read by pushing “Read”.
Write	Write “Write Value” to “Sub Address” of “I2C Slave Address”.
Read	Read I2C Data.
Word address mode	Transmit and receive the length of the sub address in 16bit.
Camera power	Set power supply to camera sensor ON/OFF.
Setting File Write...	Read the comma-delimited configuration file and transmit to camera. Please confirm “Format of Setting File for I2C Connecting” about I2C confirm.
SVM Info...	Display SVM Info window. This function is used for our remote support, not need to use in normal operation.
Clear	Clear “Read Value” edit box.
SVM Restart	Restart SVM board. It is used for reflecting the setting of SVM Setting Window .
SVM Setting...	Display SVM Setting Window and change such as settings of SVM board.

3.2. SVM Setting Window

SVM Setting Window is a dialog to change such as settings of SVM-03 board. This dialog is opened by pushing “SVM Setting...” button on the top window.

In the setting window, displayed setting items vary according to the kind of a recognized board. The following figures are setting windows connected with SVM-03U mode. The model number of a recognized board is shown on the window title of the setting window.

【Figure 5】Setting Window of SVMCtl



Menu lists on setting window of SVMCtl are shown on 【Table3】 and explanation lists of update and version information are shown on 【Table4】.

【Table3】Menu List of Setting Window of SVMCtl

Entry	Explanation
CKIN Out Select	Configure frequency of driving clock to supply to target.
CKIN Out Divide	Configure dividing rate of driving clock to supply to target.
Color Space Select	Set color space of data output from FPGA. – This function is fixed to YUV at present.
ITU BT.656 Mode (SAV/EAV)	Set correspondence mode to ITU BT.656. This function can't be used at present.
Polarity of Pixel Clock Edge	Set edge polarity about the data captured by DCK (pixel clock). (L→H): Capture by rising edge of clock. (H→L): Capture by falling edge of clock.
Polarity of H-Sync	Set polarity of the sync period of HS (Horizontal Synchronization) signal input from target. (See below)
Polarity of V-Sync	Set polarity of the sync period of VS (Vertical Synchronization) signal input from target. (Sww below)
Polarity of DE	Set polarity of the sync period of DE (Data Enable) signal input from target.
DE Input Mode (P1)	ON: Use P1 pin as external DE signal. OFF: Don't use DE signal. (default)
Decimation	Configure magnification of frame decimation rate. (Default 1/1)
CS Swap Mode (Only SVM-03)	Set method of the swap of byte alignment of data signal from target.
Endian Mode (Only SVM-03U)	Set byte order from camera.
Clipping	Configure clipping by pushing "Detail..." button. The current clipping ON/OFF setting is displayed on this dialog.
UVC Resolution	Set resolution of UVC. (in Pixel)
UVC FPS	Set frame rate of UVC. (in Frame per second)
UVC Color Space	Set color space of UVC.
UVC Board ID	Set device ID that is recognized as device name.
Show DIP SW...	Display setting item of DIPSW of connecting board
Cancel	Cancel without applying settings.
Set	Apply setting to SVM-03.

【Table 4】Information of update and version

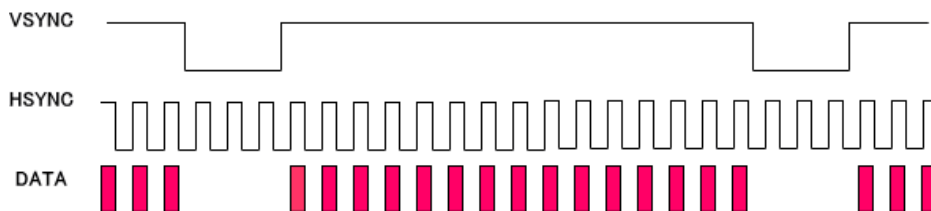
Entry	Explanation
FX3 Update...	Update FX3 firmware of SVM board. Note contents that are updated aren't applied until restarting SVM board. You need to restart SVM board after finishing update.
FPGA Update...	Update FPGA configuration of SVM board. Note you need to restart SVM board after finishing update.

Multi Update...	Update both FX3 firmware and FPGA configuration of SVM board at once. Please follow the manual of update file at the time of updating.
DLL Version FX3 Version FPGA Version	Display used DLL, FX3 FW and FPGA version of SVM-03. If board is not connected to PC definitely, FX3 and FPGA version are not displayed definitely.

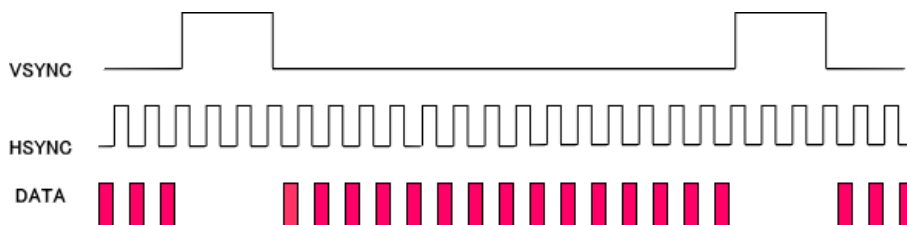
– About setting of “Polarity of H-Sync” and “Polarity of V-Sync”

You can select “Low Active” or “High Active” in setting of “Polarity of H-Sync” and “Polarity of V-Sync”.

For example, setting of “Polarity of H-Sync” and “Polarity of V-Sync” are set to “Low Active”, VSYNC and HSYNC both low at blanking period. So, SVM-03 captures in data as active data that VSYNC and HSYNC both high (Red frame part of DATA of the chart below).

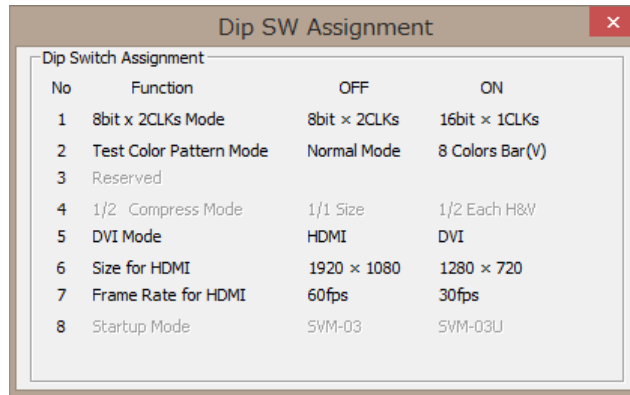


Note setting of “Polarity of H-Sync” and “Polarity of V-Sync” are set to “High Active”, VSYNC and HSYNC both high at blanking period. So, SVM-03 captures in data as active data that VSYNC and HSYNC both low (Red frame part of DATA of the chart below).



3.3. Dip SW Assignment Window

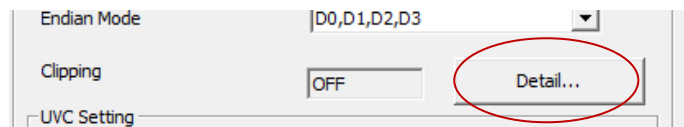
【Figure 6】 Dip SW Assignment Window



Displaying lists of setting items of DIP SW implemented on a connected board now.

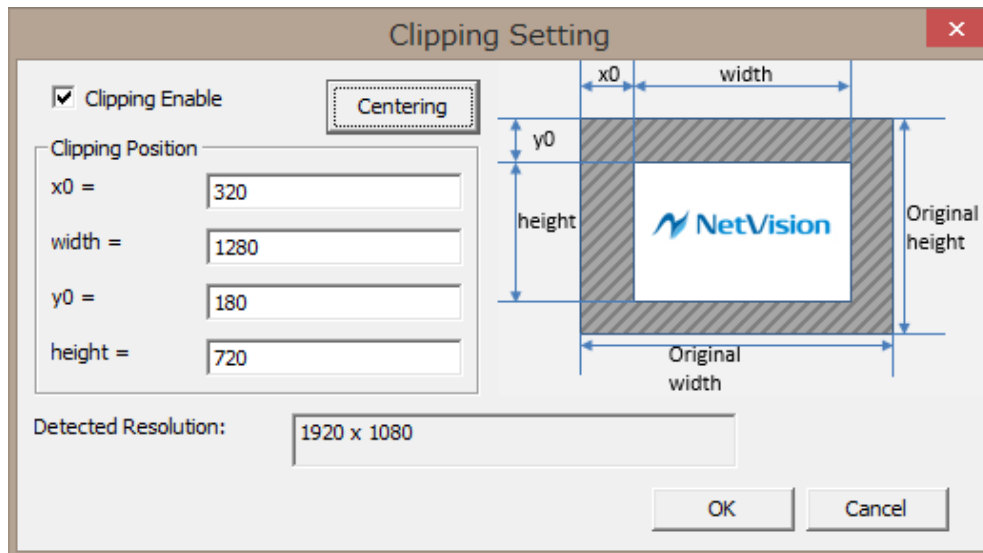
For more information about each function, please refer to hardware specification.

3.4. Clipping Setting Window



Clipping Setting window is opened when you click “Detail...” on “Clipping”.

【Figure 7】Clipping Setting Window



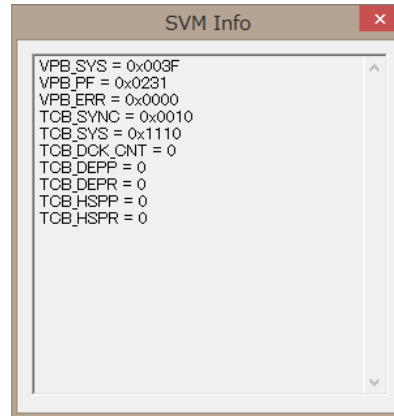
You can configure setting of clipping for input image. The setting contents are common throughout SVM-03/SVM-03U, and saved on SPI-ROM by “Set” button on “SVM Setting” window as other settings. Note it is necessary that the setting of UVC resolution equals to the resolution after clipping.

【Figure 5】Setting Items of Clipping Setting Window

Entry	Explanation
Clipping Enable	If it is checked, clipping function becomes active.
Centering	Automatically set x0 and y0 based on automatically detected resolution and value of “width” and “height” to cut from center of the window.
x0, y0	Set the coordinate of the start position.
width, height	Set width and height of clipping.
Detected Resolution	Display resolution of image data that detected by SVM board. Detect of resolution is done at the timing of displaying Clipping Setting window.
OK	Apply change and return to original window.
Cancel	Cancel change and return to original window.

3.5. SVM Info Window

【Figure 6】SVM Info Window



Window used for debugging used for our support. SVM Info window is displayed when you push “SVM Info...” button on main window. Internal status of SVM-03 board is displayed on this dialog. It is not used for normal operation.

3.6. SVM-03 Connecting Procedure

The procedure of connecting SVM-03 with PC is shown below.

1. Switch on the PC and start Windows.
2. Connect SVM-03 board with USB port on PC.
3. Set attached CD-ROM in the drive and install the driver if you are required to install driver.

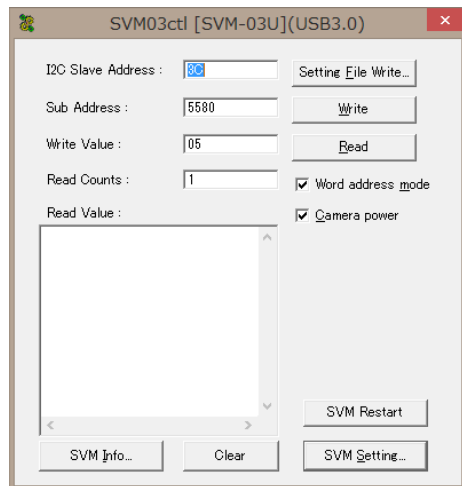
Note, for more information about install drivers, please refer to “Readme.txt” in CD-ROM.

3.7. Install of Application

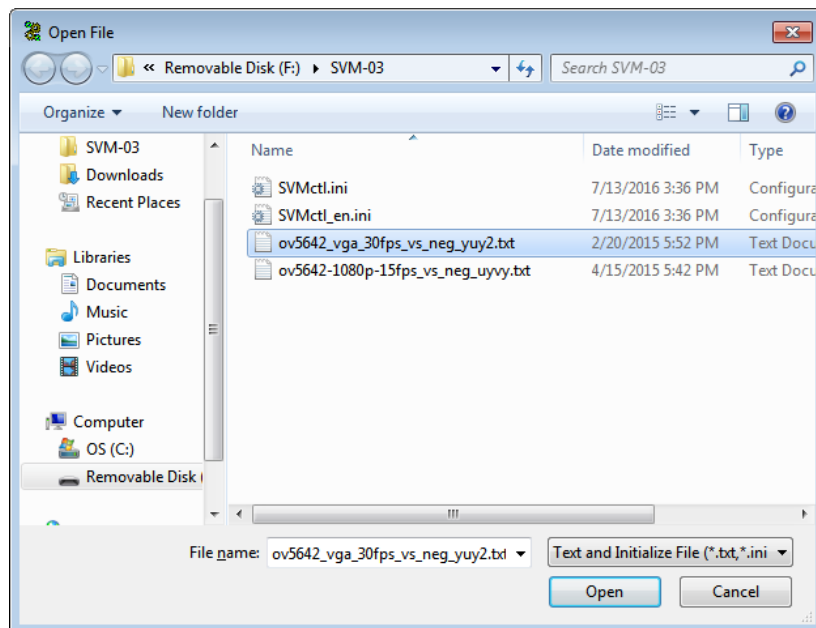
There are no installer applications. Copy Appl folder in the CD-ROM to any folder of PC.

3.8. Send I2C Data to Image Sensor

1. Start application named “SVMCtl.exe”.
2. A dialog below will be shown.



3. Input slave address of camera (7bit) at “I2C Slave Address” in hexadecimal.
4. Click “Setting File Write” button, select I2C configuration file of camera to be sent.



3.9. Format of I2C Configuration File

Text file for writing command to camera module register by I2C communication is described following forms.

UNIT, (Radix)

SLAVE, (Slave Address)

(Sub Address), (Writing Value 0), (Writing Value 1), ...

wt, (Wait Value)

- Appoint radix for Slave address, sub address and writing value on UNIT command. You can appoint “10” or “16” for radix. “10” appoints the later numerical value in decimal digit. “16” appoints the later numerical value as hexadecimal number.
- Appoint slave address by SLAVE command.
- You write to register by command beginning with sub address. Sub address is sub address in the device and appointed in 8bit or 16bit. If “Word address mode” is checked, you write sub address in word long (16bit). Contrarily, if “Word address mode” is not checked, only lower 8bit of the address level of the word head becomes effective. Appoint the value to write to register by 8bit in writing value.
- “wt” command appoints value of waiting time. You can appoint waiting time by msec unit up to 32767 in decimal.
- Commands beginning with “#” are considered as comment until line break and skip to next line. Empty line (Only line break, not include such as space) also is skipped. You can use comma or space for the end of the item.

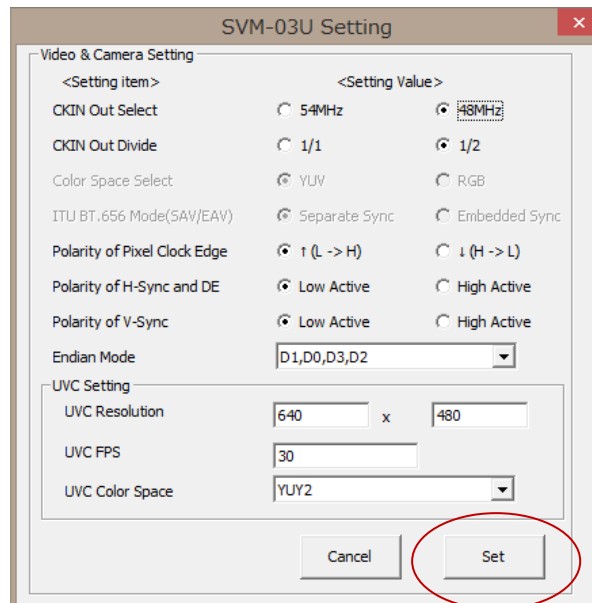
An example of configuration file is shown on the following page.

(Example of setting file)

```
# SVM-SDK Setting file sample
# date: 20xx.03.24
#
# Assuming in hexadecimal representation
UNIT,16
# Appointing slave address
SLAVE,2A
# Setting device 1
00,00
01,00,02
02,3A
03,6B
8B,00
# Waiting 100msec
wt,100
# Assuming in decimal digit
UNIT,10
# Appointing slave address
SLAVE,44
# Setting device 2
00,00
01,90
02,130
03,110
100,20
#
# END OF FILE
#
```


3.10. Configuring of SVM-03 Board Setting

Configuring of SVM board (Such as pixel format, resolution, etc.) is achieved by both this application and DIP SW (SW2) on the SVM-03 board. To configure board setting, push “Set” button after changing setting and then setting value is saved on SPI-ROM on the board. In SVM-03 mode (DIP SW 8 is off), setting is applied immediately and output image will be updated. In **SVM-03U mode (DIP SW 8 is on)**, **you need to restart SVM-03 board to apply setting**. To restart SVM-03 board, apply setting by pushing “Set” button and then **push “SVM Restart” button on the main window**.



When you open the setting window with SVM-03 board connected to PC, the application acquires current setting value and display these settings on the dialog.

Setting values saved in SPI-ROM will be read when SVM-03 board is started up by the firmware.

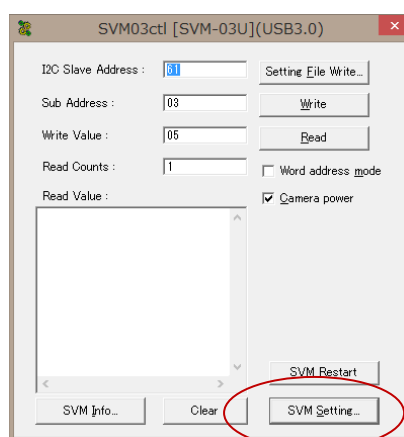
4. Update of FX3/FPGA

You can update FX3 configuration and FX3 firmware of SVM-03 board by SVMCtl software.

Update procedure is described below.

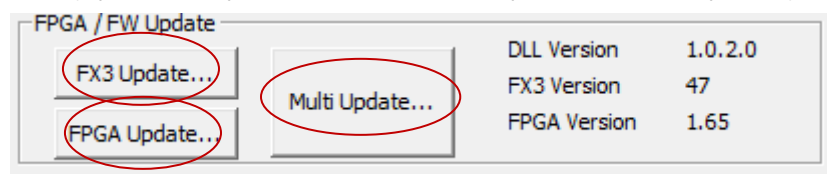
– If “FX3 version” number in SVM-03U mode is less than 45, update failure may be occurred, so we strongly recommend to update in SVM-03 mode.

1. Confirm that PC doesn't process much load, connect SVM-03 board with PC, and start SVMCtl application.
2. Push “SVM Setting” button.



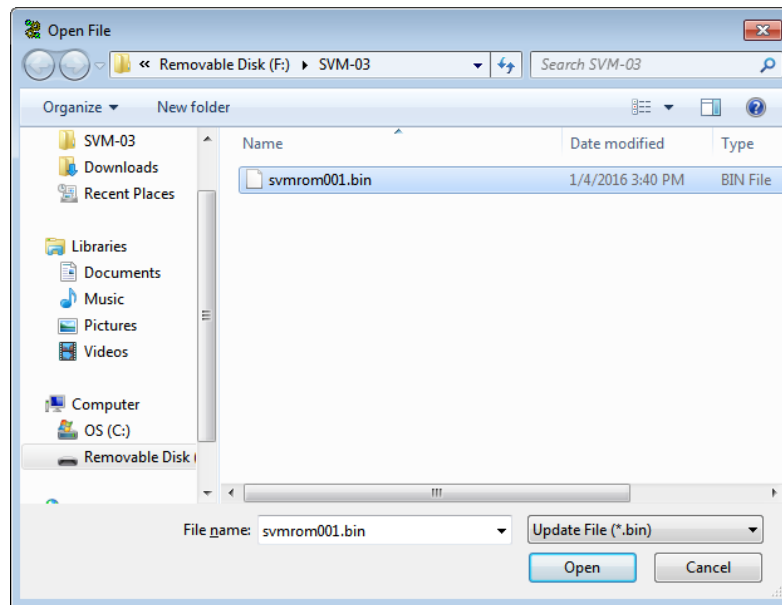
3. SVM Setting window will be shown.

For normal update process, push “Multi Update...” button then updating of firmware and FPGA configuration starts at the same time. If you try to update FX3 firmware or FPGA configuration separately, push “FX3 Update...” button or “FPGA Update...” button, respectively.



4. After window for selecting file to update is displayed, select the file. The extension of file is as follows.

Target for update	File extension
FX3 Update	.img
FPGA Update / Multi Update	.bin

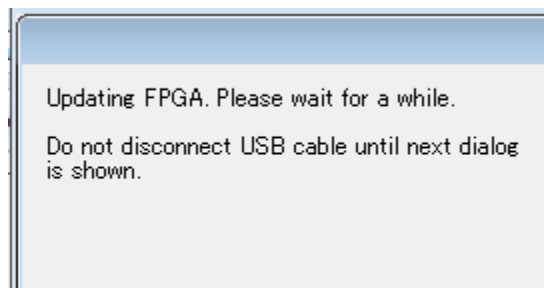


5. Dialog for the last confirmation of update is displayed, press “OK” if you want to execute updating.



6. Updating process begins. The following dialog is displayed during updating. Note that the updating process takes for around 5 min. for SVM-03U, about 3 min. for SVM-03.

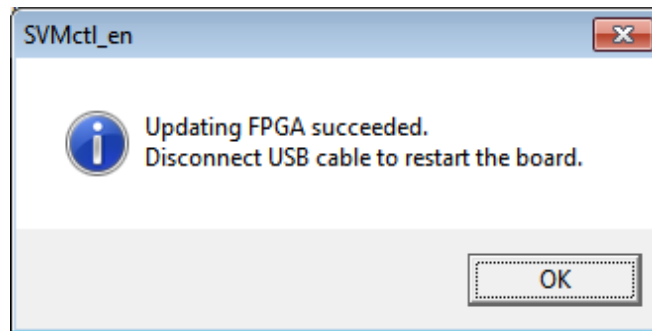
– Be careful not to switch off the PC or pull out USB cable until this dialog is closed. SVM-03 will be unable to start up in such condition.



7. Dialog is displayed when updating is finished.

[In case of success]

When updating is finished normally, pull out USB cable and restart SVM-03 board. Updated firmware and FPGA is applied after restarting.



[In case of failure]

If updating is failed, a dialog informing failure is displayed. In this case, please update again.

– If updating is failed, please update again **without pulling out** USB cable. If you pull out USB cable in the state of failing to update, **SVM-03 will be unable to start up.**