FASTCAM Control SDK Library "PccLib" Programming Manual

Rev.1.00

English Edition

PccLib Ver2.9.3.7 or later

PHOTRON LIMITED

Table of contents

Chapter 1. Outline of This Programming Manual

Congratulations on the acquisition of your Photron High-Speed Video Camera.

This chapter describes how to use the **FASTCAM Control SDK Library** and the required environment for it.

Before using this library, connection of a high-speed camera(s) to a computer (PC) and installation of the hardware driver are necessary. See the user's manuals of hardware equipment for instructions for connection.

The method of hardware driver installation varies by the model of high-speed camera. See the driver installation manual attached to your high-speed camera and install in the correct manner befor using the SDK library.

Section 1.1. Who Should Read This Manual

This Manual has been compiled for users who wish to develop application software programs using the FASTCAM Control SDK, the basic software for generating applications using Photron high-speed video cameras. It is written assuming the users have experience in using development tools for VisualC++6.0 and VisualC++.NET, and sufficient knowledge of technical terms for programming.

Section 1.2. Operating Environment for The Library

The environment required for operating this library is as follows:

Computer:	PC/AT compatible computer
Operating System:	Microsoft Windows98/98Se/Me, Windows2000 Professional, XP Professional, XP Home *1, *2
CPU:	Intel Pentium or compatible CPU, *3 PentiumIII 1GHz or higher recommended
Memory:	64MB minimum; 256MB recommended for multiple camera or high-resolution camera operation
HDD:	Over 20MB space needed of library installation; 500MB recommended for program development works
Development Environment:	Microsoft VisualC++5.0 or later
Others:	Large capacity HDD or removable media recommended to store recorded image data; CD-ROM drive recommended for installation of software

Notes:
*1: OS depends on the camera and PC to be used. Refer to the operation manual of the camera.

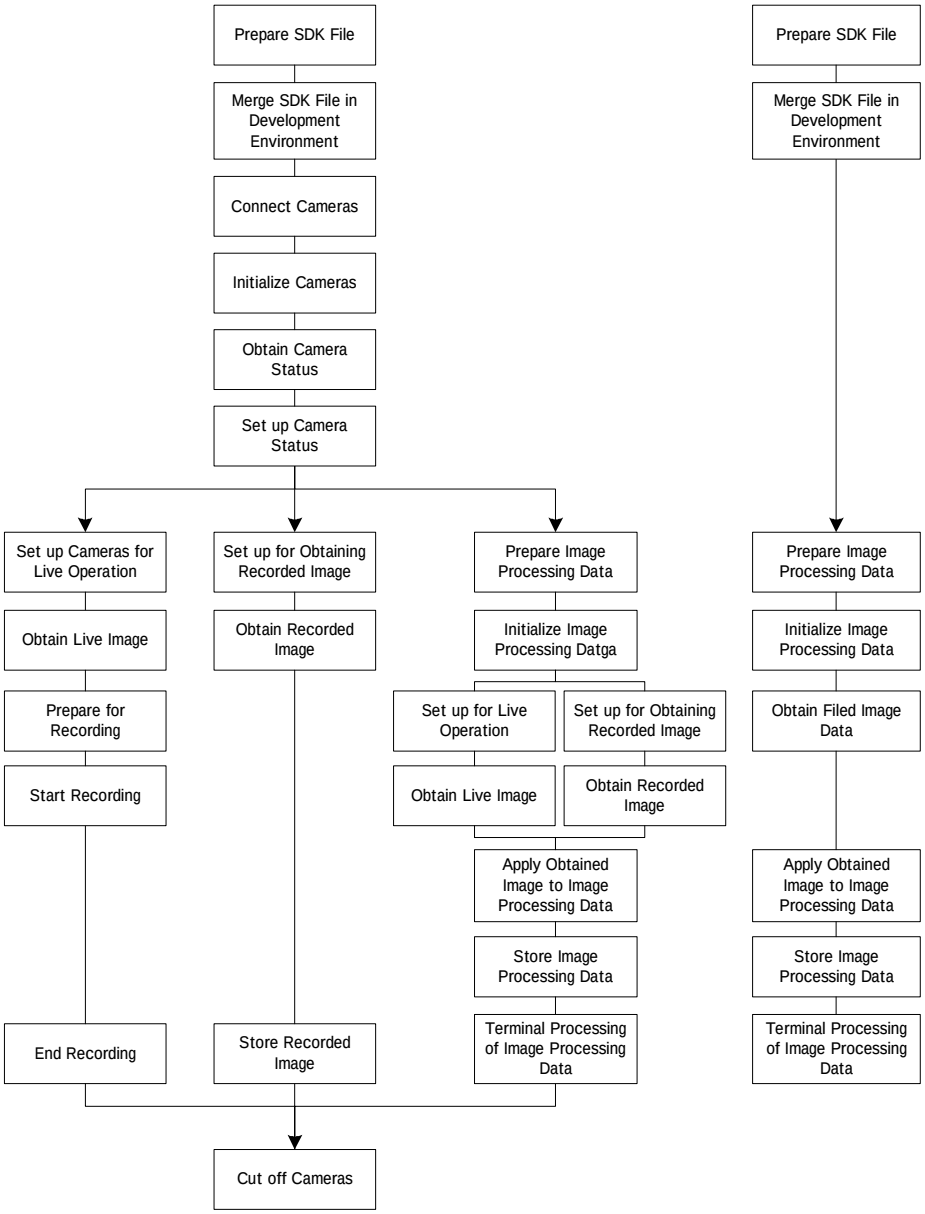
*2: Microsoft, Windows, VisualC++ are registered trademarks or trademarks of Microsoft Corporation in the US and other countries.

*3: Pentium is a registered trademark of Intel Corporation.

Chapter 2. SDK Library Operation

This chapter describes the four basic operations to use the FASTCAM Control SDK.

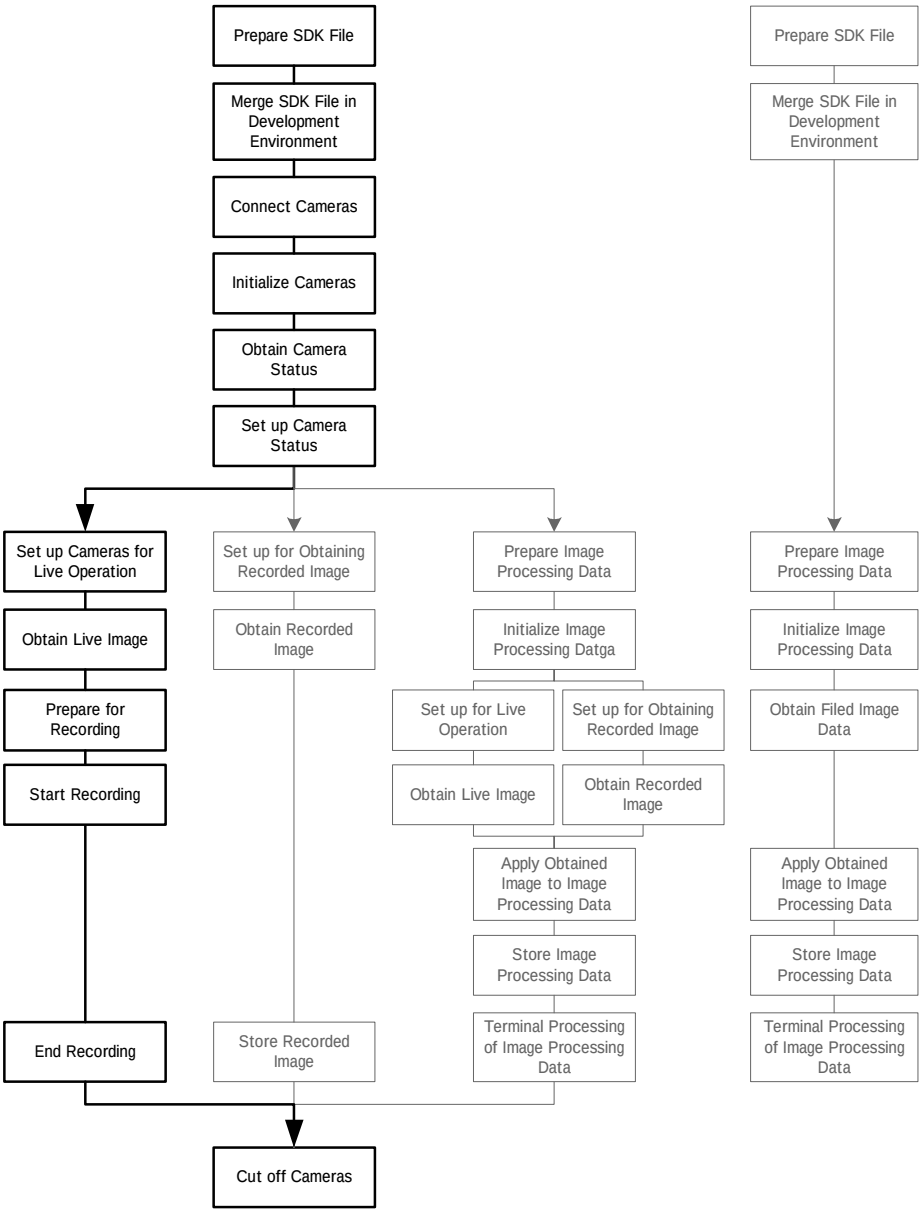
Section 2.1. SDK General Operation Flow Charts.



Section 2.2. discusses from preparation of the SDK to live operation to recording to ending the SDK operation.
Section 2.3. discusses how to obtain and store image data recorded by camera.
Section 2.4. discusses how to store image data, obtained from a camera, using image processing class prepared under the SDK.

Section 2.5. discusses how to use the image processing class to read and write stored image data.

Section 2.2. Flow Chart of Preparation to Live Operation to Recording to Ending of SDK Operation



Section 2.2. discusses from preparation of SDK to live operation to recording to ending SDK operation.

Subsection 2.2.1. Preparation of SDK File

The structure of files contained in the SDK Library is as follows:

Dll¥

PccLib.dll	PccLib main DLL
FcamPCI.dll	Device DLL for FASTCAM-PCI
FcamPCI2.dll	Device DLL for FASTCAM-PCI R2
FcamPLMV.dll	Device DLL for FASTCAM-X 1280PCI
Fcam1394.dll	Device DLL for IEEE1394I/F compatible FASTCAM series cameras
FcamEth.dll	Device DLL for Ethernet compatible FASTCAM series cameras
FcamOpt.dll	Device DLL for Optical I/F compatible FASTCAM series cameras
FcamNPCI.dll	Device DLL for FASTCAM-512PCI
Ijl15.dll	JPEG library DLL
IrigLib.dll	IRIG library DLL

Lib¥

PccLib.lib	PccLib inport library file

Include¥

PccLib.h	PccLib Header file
ConstantValues.h	Constant value declaration header file
CameraControl.h	Header file for CameraControl class
ImageData.h	Header file for CImageData class
LutControl.h	LUT header file
IrigLib.h	IRIG header file

Subsection 2.2.2. Merge SDK File in Development Environment

This subsection describes how to merge this library in the development environment (VisualC++6.0/VisualC++.NET) and necessary setups.

1) To set up a project in VisualC++6.0 environment
Add the library to VisualC++6.0 in the following manner:

1. Start VisualC++6.0 and open a project to merge this library into.

2. In the VisualC++6.0 menu, go to “Project” -> “Setup” and open “Set up project”.

3. In the “Link” tabs, go to “General” -> “Object/Library module” and add “PccLib.lib” there.

4. In the “Link” tabs, go to “Input” -> “Additional library path” and add the path name there copying PccLib.lib.

5. Go to “C/C++” -> “Preprocessor” -> “Include file path” and add the path name there copying the header file of this library.

2) To set up a project in VisualC++.NET environment
Add the library to VisualC++.NET in the following manner:

1. Start VisualC++.NET and open a project to merge this library into.

2. In the VisualC++.NET menu, go to “Project” -> “Property” and open “Proper page” dialog of the project.

3. Go to “Property configuration” -> “Linker” -> “Input” and add “PccLib.lib” to “Addition dependant file”.

4. Go to “Property configuration” -> “Linker” -> “General” -> “Additional library directory” and add a path name copying PccLib.lib there.

5. Go to “Property configuration” -> “C/C++” -> “General” -> “Additional include directory” and add a path name there copying the header file of this library.

Note on Operation of Applications:
To operate applications that are made by incorporating this library, all DLL files must be placed in the same folder as the files to be executed or in a folder assigned with an effective PATH within the system.

It is possible to keep copies of DLL files in the Windows system folder. But you must be careful because the specification of files may have to be changed at a version upgrade and newly revised SDK library may erroneously refer to the DLL files of older version remaining in the system folder.after revision.

Subsection 2.2.3. Connect to Cameras

Right after the application with FASTCAM Control SDK incorporated has started up, the FASTCAM Control SDK has no control over the connected camera. The FASTCAM Control SDK and the cameras must be connected by the following process:

1) Construct Camera Control Class

A camera control class is the class that controls the connected camera. By constructing a camera control class, the FASTCAM Control SDK detects a camera connected to the PC and turns it controllable.

The following shows an example of program to construct a camera control class:

```
// camera control class
CCameraControl *m_CameraControl;

// construct camera control class
m_CameraControl = new CCameraControl(DEVICE_SELECT_AUTO);
```

DEVICE_SELECT_AUTO is an argument that makes detectable all the cameras that can be connected. By changing this argument, only cameras that are connected with relevant interface can be detected.

Example) To detect cameras that can only be connected with IEEE1394 interface:

```
m_CameraControl = new CCameraControl(DEVICE_SELECT_1394);
```

One camera control class controls any one single camera that can be connected (when DEVICE_SELECT_AUTO is selected). Therefore, in order to control all cameras connected to the PC, the same number of camera control classes, as the connected cameras, must be prepared.

```
// Camera control class (for 3 cameras)
CCameraControl *m_CameraControl[3];

// Construct camera control class (to control camera 1)
m_CameraControl[0] = new CCameraControl(DEVICE_SELECT_AUTO);

// Construct camera control class (to control camera 2)
m_CameraControl[1] = new CCameraControl(DEVICE_SELECT_AUTO);

// Construct camera control class (to control camera 3)
m_CameraControl[2] = new CCameraControl(DEVICE_SELECT_AUTO);
```

2) Obtain The Number of Cameras to Connect

hen the construction of camera control class is successful, the number of the cameras connected within the camera control class can be set up.

The number of cameras connected is obtained using the GetNumberOfDevice function.
If the number of connected cameras counts 1 or more, it indicates the construction of camera control class was successful.
Example of program for obtaining the number of connected cameras is shown below:

```
// Obtain number of connected cameras
nSts = m_CameraControl->GetNumberOfDevice(&nMaxCameranumber);

if(nSts != PCC_ERROR_NO_ERROR)
{
    printf("GetNumberOfDevice error :%08x¥n",nSts);

    delete m_CameraControl;
}
```

See the reference manual for the reset value of the member function of each camera control class.

Subsection 2.2.4 Initialize Camera

Using the control for a successfully connected camera, initialize each camera control library prepared for the camera model and interface type. The status of the connected camera is confirmed by initialization.

The following is an example of a program to initialize a connected camera:

```
// Initialize FASTCAM Control SDK and each camera control library
nSts = m_CameraControl->Init(1);
```

The argument for initialization command is the control number of the connected camera. The highest value is the maximum number obtained by the GetNumberOfDevice function.

See the reference manual for the reset value of the member function of each camera control class.

Subsection 2.2.5 Obtain Status to Camera

Once the normal operation of the connected camera has been confirmed by initialization of camera control class prepared for each camera, obtain the current setting status of the connected camera to confirm it.

By confirming the setting status, it is possible to confirm the setting status for framing conditions and recording method with the connected camera. The items with which you should confirm the setting status of a camera varies by the camera model. Refer to the hardware manual of each camera to obtain and confirm the setting status of each camera as necessary.

The setting status of a camera is managed by dividing items into two groups – basic functions and extended functions. To obtain the setting status of a camera, you can use either of the two methods – group acquisition of all items or one-by-one acquisition of each of items (functions).

However, because some of the setting status can only be obtained by the group acquisition method, you must be careful when selecting a method depending on the nature of the software to develop.

1) Group acquisition – to obtain the camera status at one time

This method obtains, at one time, all setting status that was obtained at initialization of the camera within the camera control class or the camera status after any change was made.

The following is an example of program to obtain camera status at one time:

```
CAMERA_PARAMS    m_CamaraParamas;// Base camera parameter structure
CAMERA_PARAMS_EX    m_CameraParamasEx;// Extended camera parameter structure

// Group acquisition of setting status of camera's basic functions
nSts = m_CameraControl->GetCameraParams(m_CameraParams);

// Group acquisition of setting status of camera's extended functions
nSts = m_CameraControl->GetCameraParamsEx(m_CameraParamsEx);
```

Information on camera is contained in CAMERA_PARAMS and CAMERA_PARAMS_EX structures.
Decision or setting of functions that can be set on camera can be done by obtaining or resetting the both structures.

See the reference manual for setting status of basic and extended functions that are obtainable.

2) One-by-one acquisition of camera status

This method lets you obtain, one by one, setting status all functions that was obtained at initialization of the camera within the camera control class or the camera status after any change was made.

The following shows an example of program to obtain camera setting status one by one:

```
int   m_nRecordRateList[LIST_MAX_NUMBER];// Record rate list
int   m_nRecordRate;// Record rate
```

The LIST_MAX_NUMBER being used in the size which was prepared to obtain each of setting values is the maximum list size defined in the header file of the camera control class.

```
// Obtain monochrome/color mode of the connected camera
m_CameraControl->IsColor((BOOL &)color);
```

This decides whether the connected camera is color or monochrome model. TRUE for the argument of the IsColor function means color model and FALSE monochrome.

```
// Obtain record rate list
nSts = m_CameraControl->GetRecordRateList((int
*)m_nRecordRateList,LIST_MAX_NUMBER);
```

Any of the record rates can be obtained that are set on the connected camera. Note that some camera models have record rates other than that are normally set by this function.

When you wish to obtain a list of set values, be sure to have a size for variables for acquisition using LIST_MAX_NUMBER.

```
// Obtain current record rate
nSts = m_CameraControl->GetRecordRate((int &)m_nRecordRate);
```

Use this to obtain the framing rate currently set on the connected camera.

See the reference manual for the reset value of member function of each camera control class.

Subsection 2.2.6 Set up Camera Status

Recording conditions (resolution, recording method, etc.) may be set by changing the camera setting status.

By setting the camera status, you can set the status, such as record rate and mode of recording, that the connected camera can work in.

After setting the status, confirm the newly set status on the camera and make sure if the camera is correctly operating as it has been set.

The items to set vary by the camera model. Refer to the hardware manual of each camera before making necessary setting.

The camera setting status is managed by dividing the items into two groups – basic functions and extended functions. To set a camera, you can use either of the two methods – group setting of all items or one-by-one setting of each of items (functions).

However, because some of the setting status can only be attained by the group setting method, you must know the nature of the software that you wish to develop before selecting a method..

1) Group setting – to set the camera status at one time

This method sets all setting status on a camera at one time.

The following is an example of program to set camera status at one time:

```
CAMERA_PARAMS    m_CamaraParamas;// Camera parameter structure
CAMERA_PARAMS_EX    m_CameraParamasEx;// Extended camera parameter structure

// Group setting of camera's basic functions
nSts = m_CameraControl->SetCameraParams(m_CamaraParamas);

// Group setting of camera's extended functions
nSts = m_CameraControl->SetCameraParamsEx(m_CameraParamasEx);
```

When you change settings on a camera, all of items that can be set on CAMERA_PARAMS or CAMERA_PARAM_EX structure must be reset. On some models of camera, it may be a time-consuming procedure.。

See the reference manual for basic and extended functions that are resettable.

2) One-by-one setting of camera functions

This method lets you set functions of the camera one by one.

The following shows an example of program to set functions of camera one by one:

```
int    m_nRecordRate;// Record rate

// Set current record rate
nSts = m_CameraControl->SetRecordRate(m_nRecordRate);
```

The SetRecordRate function changes the record rate.
The record rate to be set as the argument is a value obtained by the GetRecordRateList function.

See the reference manual for the reset value of member functions of each camera control class.

Subsection 2.2.7 Set up Camera for Live Operation

This subsection discusses how to set up the connected camera in the live operation mode to work under the recording conditions (record rate, resolution, etc.) currently set on it. By setting the connected camera in the live mode, you can obtain the live image from the camera as image data.

1) Confirm Live Operation

Confirm if the connected camera is the live operating status.

```
// Decide if camera is live
nSts = m_CameraControl->IsLive((BOOL &)check);
```

When the argument for the IsLive function is TRUE, the camera is live. When it is FALSE, the camera is playing image recorded in memory.

2) Set up for Live Operation

Set up the connected camera in live status.

```
// Set up in live status
nSts = m_CameraControl->OnLive(TRUE);
```

The argument for the OnLive function is used to set up the camera status.
When the argument is TRUE, the camera is set up in live status. When it is FALSE, the camera is set to play back recorded image.

```
// Decide if camera is live
nSts = m_CameraControl->IsLive((BOOL &)check);
```

After changing the camera status using the OnLive function, use the Is Live function to confirm if the camera has been correctly set in the new status.

See the reference manual for the reset values of the member functions of each camera control class.

Subsection 2.2.8 Obtain Live Image

After confirming the live status of the connected camera, obtain image to make sure the live image is transferred to the PC correctly.
The size of image data is determined by the image size obtained by camera status and the type of the camera – monochrome or color.
The live image data obtained from a monochrome camera is binary data with origin at the upper left corner of the image, while image data from a color camera is of interleave format (RGBRGB……).

The following shows an example of program to obtain live image from the camera:

```
// Obtain live image
nSts = m_CameraControl->TransferFrame(-1,ImageDataBuf);
```

To obtain live image data, the first argument for the TransferFrame is [-1] and the second argument denotes the memory area to store the image data obtained from the camera.
Before transferring the image data, determine the second argument taking into consideration the camera resolution and necessary memory area.

See the reference manual for the reset value of member functions of each camera control class.

Subsection 2.2.9 Prepare for Recording

The cameras that are controlled by the FASTCAM Control SDK must be prepared for recording. By the preparation procedure described here, the cameras are made ready for a command to start recording.

The following is an example of program to make the connected camera ready for recording:

```
// Set up for recording ready
nSts = m_CameraControl->OnRecordReady(TRUE);
```

The argument for the OnRecordReady function is used to set the camera into record-ready status. TRUE for the argument makes the camera ready for recording and FALSE cancels the setting of ready status.

```
// Confirm record ready status
nSts = m_CameraControl->IsRecordReady((BOOL &)check);
```

After setting the camera by the OnRecordReady function, confirm the record-ready status using the IsRecordReady funtion. If the argument of the IsReordReady function is TRUE, the camera is ready to record, but if it is FALSE, the camera is not ready.

See the reference manual for the reset values of member functions of each camera control class

Subsection 2.2.10 Start Recording

The procedures in the previous subsections have set the camera into the record-ready status. The camera is now ready to start recording at a trigger.

The trigger mode (i.e. START mode), which requires issuance of a record trigger at the beginning of recording, a command for the TriggerIn function is also issued, at the start of recording, which sets the base point of recording.
For other trigger modes (i.e. CENTER, RANDOM, etc.) a command for TriggerIn function must be issued to determine the base point frame number for a recording, in addition to one for the OnRecord function.

Note: Descriptions on recording operations in this manual are for operation by software only. For recording by hardware triggers, see the user's manual for each camera.

The following shows an example of program to record on the connected camera:

```
// Set to start recording
nSts = m_CameraControl->OnRecord(TRUE);
```

Set TRUE as the argument for the OnRecord function, and the camera starts recording.

```
// Confirm recording status
m_CameraControl->IsRecord((BOOL &)check);
```

Use the IsRecord function to confirm if the camera has started recording. If the argument for the IsRecord function is TRUE, the camera is now recording, and if the argument is FALSE, the camera has finished recording.

See the reference manual for the reset values of member functions of each camera control class.

Subsection 2.2.11 End Recording

The camera control class does not monitor the camera to end recording. You must confirm and monitor the status while the camera is in the process of recording.

Confirm the end of recording on the camera in the process below:

1) How to Confirm End of Recording

```
// Decide end of recording
m_CameraControl->IsRecord((BOOL &)check);
```

Use the IsRecord function to confirm the end of recording as well as start.
While the camera is recording, the argument of the IsRecord function is TRUE.
When a recording ends, the argument turns to FALSE.

2) Force to End Recording

You can force the camera to end recording at any time you wish to cancel or abort the recording. If a recording is cancelled halfway, the recorded image up to the moment of cancellation remains in memory.

The following shows an example of program to force the camera to end recording:

```
// Force to end recording
nSts = m_CameraControl->OnRecord(FALSE);
```

Set FALSE as the argument for the OnRecord function and the camera is forced to end recording.

See the reference manual for the reset values of member functions of each cameraq control class.

Subsection 2.2.12 Cut off Camera

As soon as control finishes on the connected camera, the camera control class deletes the information on the camera and returns to the status prior to initialization.
The connection between the Control SDK and the camera is retained within the Control SDK until the parameters of constructed camera control class are released.

To restart to operate the camera after cutoff, you must go back to Subsection 2.2.4. and redo the whole procedure from initialization of the camera.

The following shows an example of program to end operating a camera.

```
// End camera control
nSts = m_CameraControl->Exit()
```

See the reference manual for the reset values of member functions of each camera control class.

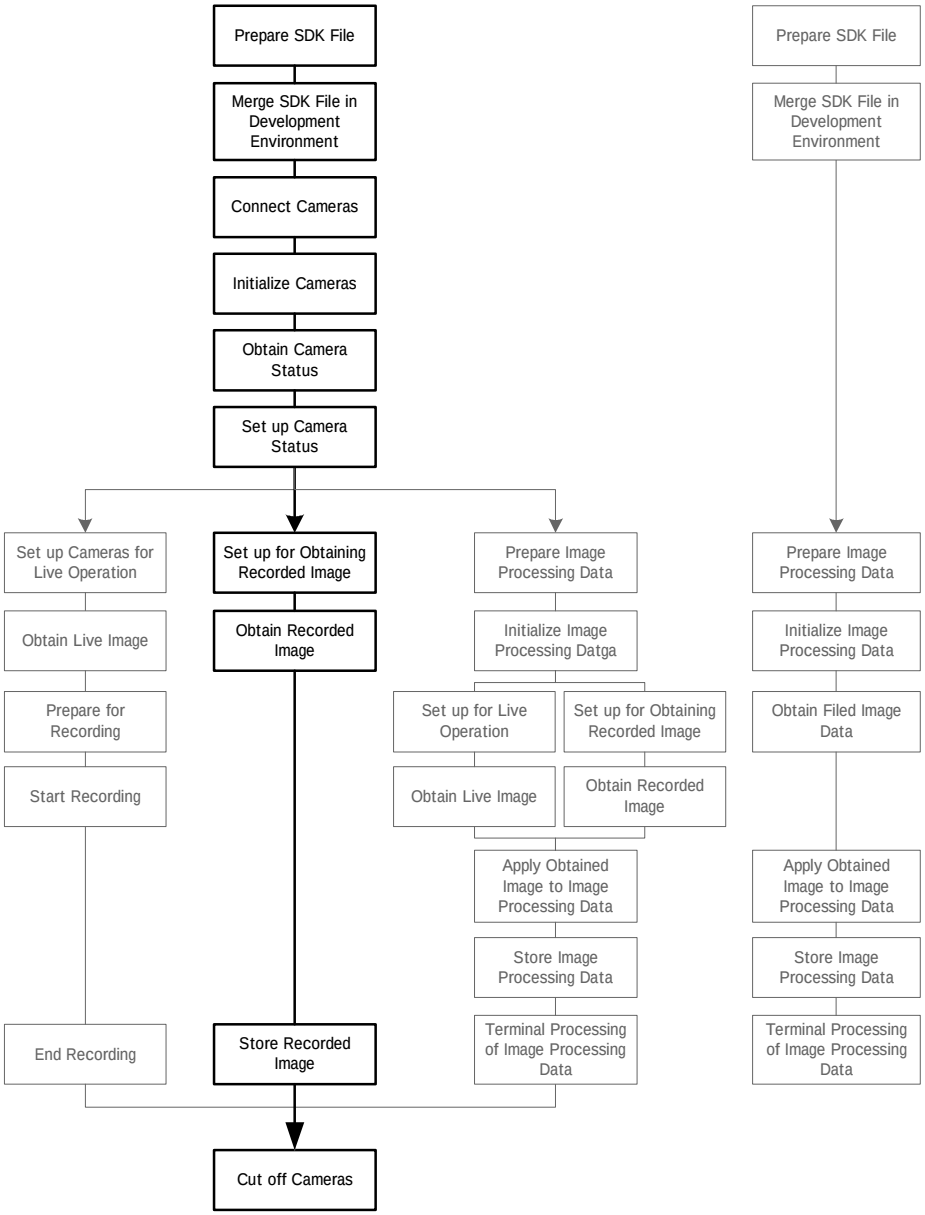
Section 2.3. Obtain and Store Recorded Image

Recorded image is retained in the hardware memory of the camera. The FASTCAM Control SDK obtains any image frame from the camera memory.

As soon as the camera, or the PC for a PCI type camera, is switched off, the image recorded in the hardware memory is lost. So, if you wish to retain any recorded image for future use, the image must be obtained and stored in an appropriate manner.

This section describes how to obtain and store image that is recorded in the hardware memory of the camera.

See the previous sections for procedure for camera connection to start and end of recording.



Section 2.3. discusses how to obtain and store image data recorded by camera.

Subsection 2.3.1 Setup for Obtaining Recorded Image

In order for the FASTCAM Control SDK to obtain recorded image from the camera memory, the camera must be reset from the live recording status to display (playback) status. Unless this change of status is made, any necessary image cannot be obtained from the camera memory. So be sure to change the camera status.

The following shows an example of program to reset the camera to the playback status:

```
// Set camera to playback status
nSts = m_CameraControl->OnLive(FALSE);
```

Use the OnLive function to reset the camera status. Setting TRUE as the argument for the OnLive function makes the camera set in the live status, and FALSE in the playback status.

```
// Decide if camera is in live status
nSts = m_CameraControl->IsLive((BOOL &)check);
```

After changing the camera status by OnLive function, use the IsLive function to confirm if the camera has been set in the playback status.

See the reference manual for the reset values of member functions of each camera control class.

Subsection 2.3.2 Obtain Recorded Image

This subsection describes how to obtain recorded image of the specified frame number. Image is obtained by the frame. The camera manages the recorded image giving a frame number to each of the recorded frames. The FASTCAM Control SDK obtains recorded image from the camera memory by assigning frame numbers of the frames of interest.

As is the case with the obtained date from live image, the monochrome image data is binary with its origin in the upper left corner, and color image data is of interleave format (RGBRGB……) with its origin in the upper left corner.
The size of image data transferred from the memory depends on the image size and the type of the image, monochrome or color, when it was originally recorded in the memory from the camera. Image data should be stored in such a storage format that will allow other applications to view.

To obtain the image frame at the trigger point, set the first argument for the TransferFrame [1]. See the reference manual for the details of frame number management within the camera memory.

1) Obtain Camera Status at Recording

This confirms the image status when the recorded image was transferred to memory.

Camera status at recording

```
// Obtain current resolution
nSts = m_CameraControl->GetResolution((DWORD &)m_dwResolution);
```

Use the GetResolution function to confirm the resolution at recording to find out the image size when it was transferred to memory.
Confirmation of image size at recording must be done only after setting the camera into the playback status. The image size displayed in the live mode does not necessarily match that of recording, and the difference between the image size and the memory size prepared by the software for transfer of image data may result in a transfer error.

2) Obtain Recorded Image

If the target memory area for the image to be transferred into is smaller than the image size, a memory access error may result. Be sure to check the image resolution information (see the previous description) to set the target memory size larger than the image to be obtained.

The following shows an example of program to transfer recorded image assuming the image size is known:

```
// Obtain recorded image
nSts = m_CameraControl->TransferFrame(1,ImageDataBuf);
```

The first argument for the TransferFrame function denotes the frame number of the recorded image to be transferred. Usually, setting is so made by the CcameraControl function that the first frame at the start of recording is numbered frame [1]. The frame numbers that can be used to assign frames for transfer vary by the trigger mode.
To obtain image frames of interest from the camera memory, set the corresponding frame numbers in the above program.
See the reference manual for the reset value for member functions of each camera control class.

Subsection 2.3.3 Store Recorded Image

As explained in Section 2.3. Obtain and Store Recorded Image, the image recorded in the hardware memory is erased when the camera power, or the computer power for PCI type cameras, is switched off. So any image that you wish to retain for future use must be obtained and stored in the computer.

The following shows an example of program to store image (1280 x 1024 resolution) obtained from a camera in the DIB format:

```
// Obtain mono/color mode of connected camera
m_CameraControl->IsColor((BOOL &)color);

// Obtain recorded image
nSts = m_CameraControl->TransferFrame(1,ImageDataBuf);

// Open file in new mode to store obtained image
CFile    file;// file class
file.Open("C:¥¥temp.bmp",CFile::modeCreate|CFile::modeWrite|CFile::typeBinary);

// Decide result of IsColor function
if(color==TRUE)
{
      // To store image from color camera
      // Set up BMP file information
      memcpy((char *)&m_BmpFileHdr.bfType, "BM", 2);
      m_BmpFileHdr.bfSize = sizeof(BITMAPFILEHEADER) + sizeof(BITMAPINFOHEADER)
+ 1280 * 1024 * 3;
      m_BmpFileHdr.bfReserved1 = 0;
      m_BmpFileHdr.bfReserved2 = 0;
      m_BmpFileHdr.bfOffBits = sizeof(BITMAPFILEHEADER) +
sizeof(BITMAPINFOHEADER);

      m_BmpInfoHdr.biSize = sizeof(BITMAPINFOHEADER);
      m_BmpInfoHdr.biWidth = 1280;
      m_BmpInfoHdr.biHeight = 1024;
      m_BmpInfoHdr.biPlanes = 1;
      m_BmpInfoHdr.biBitCount = 24;
      m_BmpInfoHdr.biCompression = 0;
      m_BmpInfoHdr.biSizeImage = 0;
      m_BmpInfoHdr.biXPelsPerMeter = 0;
      m_BmpInfoHdr.biYPelsPerMeter = 0;
      m_BmpInfoHdr.biClrUsed = 0;
      m_BmpInfoHdr.biClrImportant = 0;

      file.Write(&m_BmpFileHdr,sizeof(BITMAPFILEHEADER));
      file.Write(&m_BmpInfoHdr,sizeof(BITMAPINFOHEADER));

      // Write bitmap image

      int    nPos0,
      int    nPos1;

      for(int y=1024-1; y>=0; y--)
      {
            nPos0 = 0;
            nPos1 = nWidth*3*y;
            for(int x=0; x<1280; x++)
```

```
            {
                m_gszWkBuf[nPos0] = buf[nPos1];
                m_gszWkBuf[nPos0+1] = buf[nPos1+1];
                m_gszWkBuf[nPos0+2] = buf[nPos1+2];
                nPos0 = nPos0+3;
                nPos1 = nPos1+3;
            }
            file.Write(m_gszWkBuf,1280*3);
        }
    }
    else
    {
        // To store image from monochrome camera
        // Set up BMP file information
        memcpy((char *)&m_BmpFileHdr.bfType, "BM", 2);
        m_BmpFileHdr.bfSize = sizeof(BITMAPFILEHEADER) + sizeof(BITMAPINFOHEADER)
    + sizeof(RGBQUAD)*256 + 1280 * 1024;
        m_BmpFileHdr.bfReserved1 = 0;
        m_BmpFileHdr.bfReserved2 = 0;
        m_BmpFileHdr.bfOffBits = sizeof(BITMAPFILEHEADER) +
    sizeof(BITMAPINFOHEADER) + sizeof(RGBQUAD)*256;

        m_BmpInfoHdr.biSize = sizeof(BITMAPINFOHEADER);
        m_BmpInfoHdr.biWidth = 1280;
        m_BmpInfoHdr.biHeight = 1024;
        m_BmpInfoHdr.biPlanes = 1;
        m_BmpInfoHdr.biBitCount = 8;
        m_BmpInfoHdr.biCompression = 0;
        m_BmpInfoHdr.biSizeImage = 0;
        m_BmpInfoHdr.biXPelsPerMeter = 0;
        m_BmpInfoHdr.biYPelsPerMeter = 0;
        m_BmpInfoHdr.biClrUsed = 256;
        m_BmpInfoHdr.biClrImportant = 0;

        for(int i=0; i<256; i++ )// Generate palette information
        {
            m_BmpRgbQuad[i].rgbBlue = i;//青の度合い
            m_BmpRgbQuad[i].rgbGreen = i;//緑の度合い
            m_BmpRgbQuad[i].rgbRed = i;//赤の度合い
            m_BmpRgbQuad[i].rgbReserved = 0;
        }

        file.Write(&m_BmpFileHdr,sizeof(BITMAPFILEHEADER));//BMP ヘッダ部書き込み
        file.Write(&m_BmpInfoHdr,sizeof(BITMAPINFOHEADER));//BMP 情報部書き込み
        file.Write(&m_BmpRgbQuad[0],sizeof(RGBQUAD)*256;);//パレット情報の書き込み

        // Write bitmap image

        int    nPos;

        for(int y=1024-1; y>=0; y--)
        {
            nPos = nWidth * y;
            for(int x=0; x<1280; x++)
            {
                m_gszWkBuf[x] = buf[nPos];
                nPos++;
            }
```

```
            file.Write(m_gszWkBuf,1280);
        }
    }

    // Close fiel

    file.Close();
```

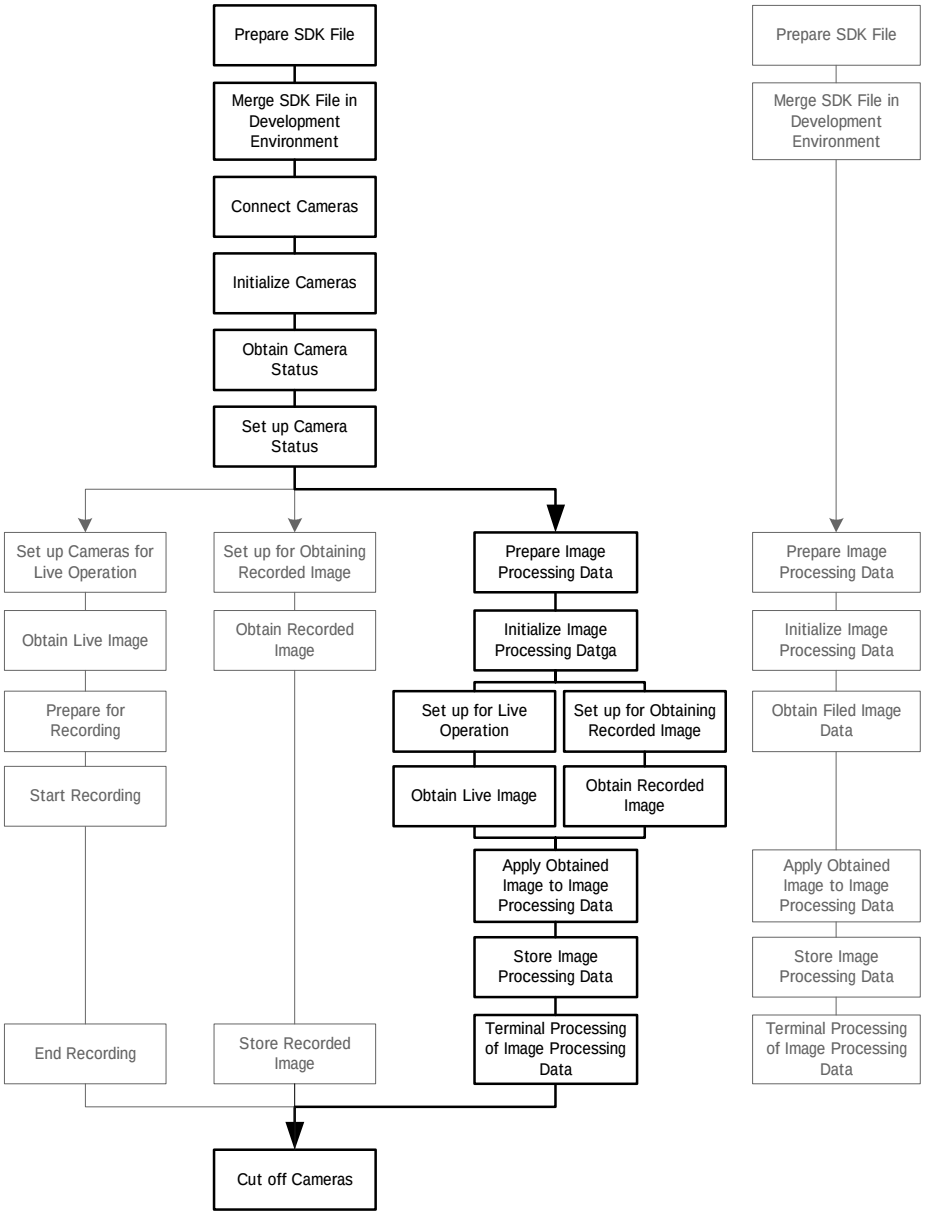
For details of the BITMAP file structure, see Platform SDK: Windows GDI in Microsoft Corporation MSDN Library.

See the reference manual for the reset value of member functions of each camera control class.

Section 2.4 Processing Image Obtained from Camer

When it is necessary to manipulate image data, obtained from a camera, in such a way as correction (e.g. lookup table correction) or conversion to a Windows image, the image data class prepared in the FASTCAM Control SDK makes available quick processing and storage means of image data. This section describes how to manipulate and store image data obtained from a camera using the image processing class prepared by the FASTCAM Control SDK.

Process the image data in the following manner after obtaining image data from the camera following the previous relevant descriptions:



Section 2.4. discusses how to store image data obtained from camera, using image processing class prepared under SDK.

Subsection 2.4.1 Prepare Image Processing Data

1) Construct Image Data Class

Image data class is a class that is used to process and store image data prepared for specific purposes. By constructing an image data class, you can process image data with the FASTCAM Control SDK.

The following shows an example of program to construct an image data class for processing and storing image data:

```
// Image data class
CImageData *m_ImageData;

// Construct camera control class
m_ImageData = new CImageData();
```

One image data class can process one image data set. To process multiple sets of image data, you need to construct sufficient number of image data classes to cover the sets of image data.

Subsection 2.4.2 Initialize Image Processing Data

1) Secure Image Data Buffer

To introduce image data into the constructed image data class, secure an image data buffer, of a size matching the image, within the image data class.
The following shows an example of program to initialize the image data class of that matches the size of the image data:

```
// Secure image data buffer matching the size of image data
nSts = m_ImageData->Init(ImageDataSize);
```

The image data class has secured, at initialization, a certain memory area of the default size that is needed for subsequent processing of image.
You need to change the memory size for image processing to the memory size necessary for image processing. The image size is measured in bytes and is set up by the argument for the Init function.

2) Set up Image Data Information

To set up image data to be processed by the image data class, the image data information must be set up in advance. You set up information regarding the image data to send over to the image data class
The following shows an example of program to set up image data information to send to the image data class:

```
BITMAPINFO    m_Bitmapinfo;// BITMAPINFO structure

nSts = m_ImageData->SetBitmapInfo(&m_Bitmapinfo);
```

To the SetBitmapInfo function, assign a BITMAPINFO structure of the image data information with setup needed for image data class
Using the information on the BITMAPINFO structure assigned by the argument for the SetBitmapInfo function, the image data class carries out necessary processing of the image data. If you set up BITMAPINFO structure information irrelevant to the image data, correct result will not be obtained.

See [Platform SDK: Windows GDI] of Microsoft Corporation MSDN Library for details of BITMAPINFO structure.

See the reference manual for the reset value for member functions of each image data class.

Subsection 2.4.3 Setup for Live Operation and Obtaining Recorded Image

Set up the connected camera for live operation referring to Subsection 2.2.7 Setup Camera for Live Operation.
Set up the connected camera for obtaining recorded image referring to Subsection 2.3.1. Setup for Obtaining Recorded Image.

Subsection 2.4.4 Obtain Live Operation and Recorded Image

Obtain live image from the connected camera referring to Subsection 2.2.8. Obtain Live Image.
Obtain recorded image from the connected camera referring to Subsection 2.3.2. Obtain Recorded Image.

Subsection 2.4.5 Apply Obtained Image to Image Processing Data

This subsection describes how to send the obtained image data, including relevant image information set up under previous descriptions, to the buffer of the image data class and to exercise various processes of the class on the image data.
If you send, to the buffer of the image data class, image data with different settings from the setup made in the previous subsection, correct result will not be obtained. You must always submit image data with correct image data information

The following shows an example of program to transfer live image data to the image data buffer:

```
// Obtain live image (set the first argument [-1] to request a transfer to the camera)
nSts = m_CameraControl->TransferFrame(-1,ImageDataBuf);

// Obtain image data buffer address for the image data class
m_ImageBuff = m_ImageData->GetImageBuff();
```

To set up image data, obtained from the camera, in the data buffer of the image data class, obtain the data buffer address for the image data class to work in. By referring to the data buffer work address, you can see the image data set up in the image data class.

```
// Copy the live image, obtained from the camera, to the image data buffer address
Memcpy(m_ImageBuff,ImageDataBuf,size);
```

This transfers the obtained image over to the image data class. The transferred image data is retained until the image data class is released.

See the reference manual for the reset value of the member functions of each image data class.

Subsection 2.4.6 Store Image Processing Data

Using the image data class to set up both image data and relevant image data information makes it easy to store the image data in a file format that is supported by the image data class.

The following shows an example of program for the image data class to store the image data in BMP file format using its file storing function.

```
// Store BMP file
nSts = m_ImageData->SaveBmpFile("C:¥¥temp.bmp");
```

With the file name assigned by the argument of the SaveBmpFile function, the image data class stores the processed image data within the image data class in the specified file format. When no processing is given, the image data class stores the image data set up in the image buffer of the image data class in the specified file format.

See the reference manual for the reset value of the member functions of each image data class.

Subsection 2.4.7 Terminal Processing of Image Processing Data

This subsection describes how to terminate the image data class in order to release the image data buffer, scaled to the image data, that has been prepared to receive the image shot by image data class.
As soon as the operation of the image data class is terminated, the image data releases the image buffer and returns to the pre-initialization status, which is retained within the FASTCAM Control SDK until the variable of the constructed image data class is released.

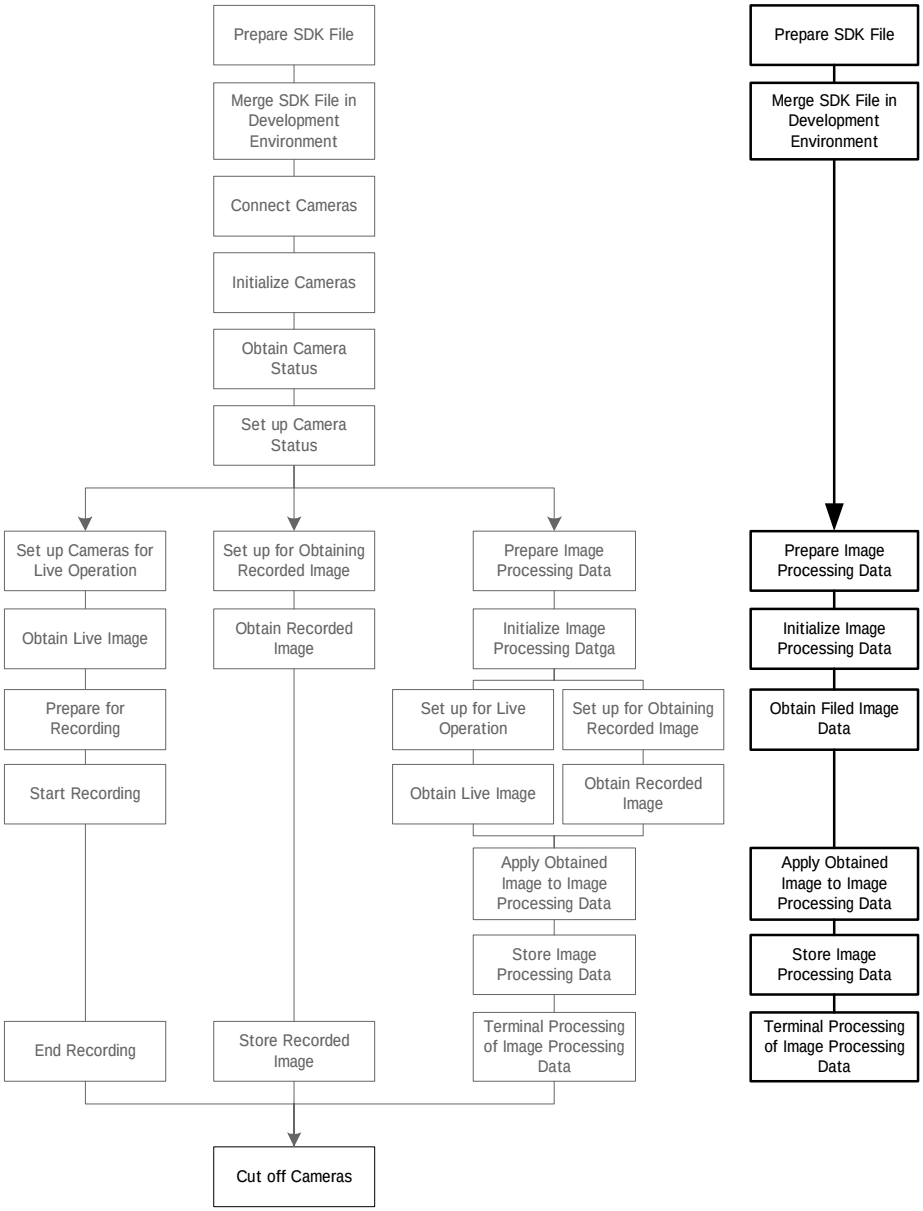
```
// Release image data class
nSts = m_ImageData->exit();
```

See the reference manual for the reset value of the member functions of each image data class.

Section 2.5 Read and Write Data Files

The image data class has a function to store image data in Photron's special format.
By reading a file, stored in the special format, with image data class, you can get the image data from the file. The image data class can also re-store the image data, read from a file of the special format, in another file format.

The following describes how to read, using the image data class, image data shot and stored by camera control class:



This section discussed how to read and write stored image data using the image data class only.

Subsection 2.5.1 Prepare Image Processing Data

Prepare image processing data following the instructions given in Subsection 2.4.1.

Subsection 2.5.2 Initialize Image Processing Data

Refer to the initialization procedure given in Subsection 2.4.2.

Subsection 2.5.3 Obtain Filed Image Data

Use the LoadFile function to obtain a file of image data.
The LoadFile function must be added with an absolute reference path to read files.

```
nSts = m_ImageData->LoadFile("C:¥¥temp.bmp");
```

The image data class tells the file format by the file extension of the argument of the files it reads.
Be sure to add a file extension to the file name you wish to read.

```
// Decide result of LoadFile function
switch(nSts)// Decide file format type
{
    case FORMAT_NONE:
        // When file format is not supported by image data class
        printf("LoadFile Format None ¥n");
        break;
    case FORMAT_BMP:
        // When file format is BMP file
        printf("LoadFile Format BMP ¥n");
        break;
    default:
        break;
}
```

When a file of different size from the predetermined image data size, the image data class automatically scales the buffer size of the image data within the image data class.

Confirm the image data information that is just read.

```
// Confirm file information
LPBITMAPINFO    m_BmpInfo;// BITMAPINFO structure
m_BmpInfo = m_ImageData->GetBitmapInfo()
```

The image data information read by the image data class is obtained by the GetBmpInfo function.

For the detail of the BITMAPINFO structure, see [Platform SDK : Windows GDI] of Microsoft Corporation MSDN Library.

See the reference manual for the reset value of the member functions of each image data class.

Subsection 2.5.4 Apply Obtained Image to Image Processing Data

Follow the instructions given in Subsection 2.4.5. Apply Obtained Image to Image Processing Data.

Subsection 2.5.5 Store Image Processing Data

Follow the instructions given in Subsection 2.4.6. Store Image Processing Data.

Subsection 2.5.6 Terminal Processing of Image Processing Data

Follow the instructions given in Subsection 2.4.7. Terminal Processing of Image Processing Data.

Chapter 3 Other Operations

This chapter describes other camera control functions that are not explained in previous sections.

Section 3.1 Connection to Multiple Cameras (application of Subsections 2.2.3. and others)

The FASTCAM Control SDK can control all of multiple cameras connected to the PC. See Subsection 2.2.3. Connect Camera Systems for instructions how to connect cameras to the PC. After multiple cameras are connected to the PC, the FASTCAM Control SDK recognized all those cameras, provided that the cameras are of one single model.

One camera control class operates one camera. So, to operate multiple cameras, you need to construct the same number of camera control classes as the number of cameras to be controlled.

As discussed in Subsection 2.2.3., camera control classes for the cameras are constructed in the following manner:

```
// Camera control class (for 3 cameras)
CCameraControl *m_CameraControl[3];

// Construct camera control class (for camera 1)
m_CameraControl[0] = new CCameraControl(DEVICE_SELECT_AUTO);

// Construct camera control class (for camera 2)
m_CameraControl[1] = new CCameraControl(DEVICE_SELECT_AUTO);

// Construct camera control class (for camera 3)
m_CameraControl[2] = new CCameraControl(DEVICE_SELECT_AUTO);
```

As described in Subsection 2.2.4., initialize the control libraries that have been prepared for each of the camera models and type of interface. After all the connected cameras are initialized, start operating the cameras.

The following shows an example of program to initialize cameras:

```
// Initialize FASTCAM Control SDK and control library for camera 1
m_CameraControl[0]->Init(1);

// Initialize FASTCAM Control SDK and control library for camera 2
m_CameraControl[1]->Init(2);

// Initialize FASTCAM Control SDK and control library for camera 3
m_CameraControl[2]->Init(3);
```

Each of the above control libraries controls its relevant camera.

Section 3.2 Access to Multiple Files (application of Section 3.2. and others)

The FASTCAM Control SDK can process multiple image data files. See also Subsection 2.4.1. Prepare Image Processing Data for information regarding preparation of image data.

As is the case with the camera control, one image data class controls one corresponding image data file. So, to process multiple image data file at a time, you need to prepare the same number of image data classes as the image data files.

The following shows an example of program to construct image data class for 3 image data files:

1) Construct Image Data Class

```
// Image class (for 3 image data files)
CimageData    *m_ImageData[3];

// Construct image data class (for image data file 1)
m_ImageData[0]= new CimageData();

// Construct image data class (for image data file 2)
m_ImageData[1]= new CimageData();

// Construct image data class (for image data file 3)
m_ImageData[2]= new CimageData();
```

2) Secure Image Data Buffer

As described in Subsection 2.4.2., secure an image data buffer with a matching size with the image data within the image data class.

The following shows an example of program to initialize the image data class for monochrome image data of 1280 (W) x 1024 (H) resolution.

```
int    ImageDataSize = 1280 * 1024;// Image size
BOOL    nSts;// Reset value of image data function

// Secure 1st image data buffer for image processing
nSts = m_ImageData[0]->Init(ImageDataSize);

// Secure 2nd image data buffer for image processing
nSts = m_ImageData[1]->Init(ImageDataSize);

// Secure 3rd image data buffer for image processing
nSts = m_ImageData[2]->Init(ImageDataSize);
```

3) Set up Image Data Information

To process multiple image data files, you set up image data information on each image data class following the instructions as described in Subsection 2.4.2. Initialize Image Processing Data, 2) Set up Image Data Information.

```
BITMAPINFO    m_Bitmapinfo;// BITMAPINFO structure

// Set up 1st image data information for image processing
nSts = m_ImageData[0]->SetBitmapInfo(&m_Bitmapinfo);

// Set up 2nd image data information for image processing
check= m_ImageData[1]->SetBitmapInfo(&m_Bitmapinfo);

// Set up 3rd image data information for image processing 定
check = m_ImageData[2]->SetBitmapInfo(&m_Bitmapinfo);
```

As to details of the BITMAPINFO structure, see [Platform SDK: Windows GDI] in Microsoft Corporation MSDN Library.

See the reference manual for the reset value of the member functions of each camera control class.。

Section 3.3 Trigger Setting and Recording Operation (application of Subsections 2.2.8 to 2.2.10)

The trigger is a type of signal to make a camera start recording. By selecting a mode of trigger, you can set the trigger status of a connected camera.

For details of recording operation by each mode of triggering, see the hardware reference manual of the camera you are using.

Subsection 3.3.1 Start Trigger

This trigger mode carries out a recording of image with the start frame being the same as the base point frame at which a trigger is given to start a recording, and automatically stops recording as soon as the memory space available for recording has been filled.

The following shows an example of program to record image in the Start Trigger mode:

```
// Set trigger mode to [Start Trigger]
nSts = m_CameraControl->SetTriggerMode(TRIGGER_START);
```

TRIGGER_START is the argument to set the recording condition of the camera to [Start Trigger]. By changing this argument, you can set the camera's triggering mode to a particular one of your choice.

```
// Obtain trigger mode
nSts = m_CameraControl->GetTriggerMode((int &)m_nTrigMode);
```

After setting the trigger mode, you can verify if the trigger mode has been correctly set.

```
// Set up record ready status
nSts = m_CameraControl->OnRecordReady(TRUE);

// Verify record ready status
nSts = m_CameraControl->IsRecordReady((BOOL &)check);

// Set up start of recording
nSts = m_CameraControl->OnRecord(TRUE);

// Check recording status
nSts = m_CameraControl->IsRecord((BOOL &)check);
```

The above shows the process of setting up and verifying the record ready status, start recording and check the recording status in a recording operation in the Start Trigger mode. When the recording finishes, you can verify the ending by the IsRecord function.

See the reference manual for the reset value of member functions of each camera control class.。

Subsection 3.3.2 Center Trigger

Use this trigger mode to record the same number of frames before and after the base point frame at which a trigger is given.

If a trigger is given after having recorded over half of the maximum number of available frames, the camera overwrites the previously recorded image and stops recording at the frame whose count corresponds to a half of the maximum number of available frames from the base point frame (where the trigger was given). In this case, you have the same number of frames recorded before and after the base point frame.

On the other hand, if a trigger is given before recording half of the maximum number of frames from the start of recording, the camera stops recording when it has recorded half of the maximum number of frames from the base point frame. In this case, however, the number of frames recorded before the base point frame is less than half of the maximum number of frames and the total number of recorded frames does not match the maximum number of frames available for recording.

So, when obtaining the recorded image data after shooting, be careful about the difference between the number of frames actually recorded and the maximum number of frames available for recording.

```
// Set trigger mode to [Center Trigger]
nSts = m_CameraControl->SetTriggerMode(TRIGGER_CENTER);
```

TRIGGER_CENTER is the argument that sets the camera's shooting condition to the Center Trigger mode. By changing this argument, you can select a trigger mode of interest.

```
// Obtain trigger mode
nSts = m_CameraControl->GetTriggerMode((int &)m_nTrigMode);
```

After changing the trigger mode, you can verify if the trigger mode of interest has been correctly set.

```
// Set up record ready status
nSts = m_CameraControl->OnRecordReady(TRUE);

// Verify record ready status
nSts = m_CameraControl->IsRecordReady((BOOL &)check);

// Set up start recording
nSts = m_CameraControl->OnRecord(TRUE);

// Very loop recording status
nSts = m_CameraControl->IsEndlessRec((BOOL &)check);

//Enter start-recording trigger
nSts = m_CameraControl->TriggerIn()

// Enter set-base-point-frame (end-recorging) trigger
nSts = m_CameraControl->TriggerIn()

// Verify end of recording
nSts = m_CameraControl->IsRecord((BOOL &)check);
```

To record in the Center Trigger mode, first you set up record ready status and then start recording using the OnRecord function. The camera starts recording when it is given a start-recording trigger

and it continues to record in a loop-recording manner, repeatedly, (the status of “endless” recording is confirmed using the IsEndlessRec function).

The base point frame is set up by the TriggerIn function. Recording stops when half of the maximum number of frames available, after the base point frame, have been recorded. Completion of recording is confirmed by IsRecord function.

See the reference manual for the reset value of member functions of each camera control class.

Subsection 3.3.3 End Trigger

The End Trigger mode makes the base point frame, at which a trigger is given, the last frame of a recording.
The camera records, when [record ready] status is set up and recording is started by the OnRecord function, in a loop-recording manner, repeatedly, overwriting the previously recorded frames, until a trigger is given.

The frame, at which a trigger is given, is the base point frame of a recording and is named frame number [1]. The frame right before frame [1] is [-1] and all other frames are given a number in the backward direction (toward the first frame of recording) with a [- (minus)] symbol. Because the frame numbers are all negative, except for the base point frame, you must be careful when you obtain image frames before frame [1].

```
// Set trigger mode to [End Trigger]
nSts = m_CameraControl->SetTriggerMode(TRIGGER_END);
```

TRIGGER_END is the argument to set the camra in the End Trigger mode. By changing this argument, you can set the camera to any recording mode.

```
// Obtain trigger mode
nSts = m_CameraControl->GetTriggerMode((int &)m_nTrigMode);
```

After changing the trigger mode, verify if the trigger mode has been set correctly.

```
// Set up record ready status
nSts = m_CameraControl->OnRecordReady(TRUE);

// Verify record ready status
nSts = m_CameraControl->IsRecordReady((BOOL &)check);

// Set up start recording
nSts = m_CameraControl->OnRecord(TRUE);

// Verify endless recording status
nSts = m_CameraControl->IsEndlessRec((BOOL &)check);

//Enter start-recording trigger
nSts = m_CameraControl->TriggerIn()

// Enter set-base-point-frame (end-recorging) trigger
nSts = m_CameraControl->TriggerIn()

// Verify end of recording
nSts = m_CameraControl->IsRecord((BOOL &)check);
```

To record in the End Trigger mode, first you set up the camera in the record ready status and then set start-recording using the OnRecord function. The camera starts recording, when it is given a start-recording trigger, and continues to record in a loop-recording manner, repeatedly, until a trigger is given. The status of “endless” recording is confirmed using the IsEndlessRec function. Recording stops at the moment a set-base-point-frame (end-recording) trigger is given. Completion of recording is confirmed by the IsRecord function.

Section 3.4 Partitioning (application of Subsection 2.2.6.)

Some of FASCTCAM series cameras have a function that divides the whole memory space into several partitions. With the memory divided, you can record several different recordings into partitioned spaces separately.

The FASTCAM Control SDK can divide the memory space of a camera that has partition capability. The divided memory spaces are managed by [partition number]. By assigning a partition number to each of recordings, the image data is recorded in separate partitions.
With the partitioning function, you can make multiple recordings continually without having to store recorded image every time a recording ends.

Subsection 3.4.1 Setting

To divide the memory space of the camera to be controlled, you must set up divisions of memory.

The following shows an example of program to divide the memory space of a camera:

```
// Obtain status to camera
CAMERA_PARAMS_EX    CameraParamasEx;// Extended camera parameter structure
nSts = m_CameraControl->GetCameraParamsEX(CameraParamsEX);
```

The information on the partition availability is contained in the extended camera parameter structure. By checking the exist_partition parameter of the extended camera parameter structure, decide if partitioning is possible.
When exist_partition is TRUE, the camera memory can be divided.

```
// Obtain camera partitioning information
nSts = m_CameraControl->GetPartitionInfo((int &)m_nMaxPartition,(int
&)m_nMaxPartitionBlock,(int &)m_nFramePerBlock);
```

If the connected camera supports memory partitioning, obtain a setup of number of available partitions by the GetPartitionInfo function.
The first argument obtained by the GetPartitionInfo function is the maximum number of available partitions and the second the maximum block size.

```
// Obtain information on camera partition block list
int m_nPartitionParamList[PARTITION_MAX_NUMBER];// Partition parameter list

nSts = m_CameraControl->GetPartitionBlockList((int
*)m_nPartitionParamList,PARTITION_MAX_NUMBER);
```

Obtain and confirm the number of blocks within each partition of the connected camera by the GetPartitionBlockList function.

```
// Calculate (divide memory size by 2) the number of blocks of each partition
m_nPartitionParamList[0] = m_nMaxPartitionBlock / 2;
m_nPartitionParamList[1] = m_nMaxPartitionBlock / 2;
```

If the third argument obtained by the GetPartitionInfo function is [-1], it means the partition size cannot be specified by the number of blocks. The whole blocks must be evenly allocated to each partition. In this case, there should be no surplus of blocks that are allocated to partitions.

```
// Set up camera partition change
nSts = m_CameraControl->SetPartitionBlock(m_nPartitionParamList,2);
```

Set up the changed partition information to the camera by the SetPartitionBlock
Function. After partitions are set up, the camera should always show partition number
[1].
When the third argument obtained by the GetPartitionInfo function is [-1], the number of partitions, which is the second argument for the SetPartitionBlock function, must have the priority of being processed first.

See the reference manual for the reset value of member functions of each camera control class.

Subsection 3.4.2 Setups (Blocks)

With cameras of the PCI type, the memory space can be divided by the unit of Block, and if the memory can be divided by the block, the memory size of each partition can freely be changed.

```
// Obtain status to camera
CAMERA_PARAMS_EX    CameraParamasEx;// Extended camera parameter structure
nSts = m_CameraControl->GetCameraParamsEX(CameraParamsEX);
```

The information on the partition availability is contained in the extended camera parameter structure. By checking the exist_partition parameter of the extended camera parameter structure, decide if partitioning is possible.
When exist_partition is TRUE, the camera memory can be divided.

```
// Obtain camera partitioning information
nSts = m_CameraControl->GetPartitionInfo((int &)m_nMaxPartition,(int
&)m_nMaxPartitionBlock,(int &)m_nFramePerBlock);
```

If the connected camera supports memory partitioning, obtain a setup of number of available partitions by GetPartitionInfo function.
The first argument obtained by the GetPartitionInfo function is the maximum number of available partitions and the second the maximum block size.

As long as the description in this subsection is effective, the third argument obtained by the GetPartitionInfo function should always a number other than [-1].

```
// Obtain information on list of camera partition blocks
int m_nPartitionParamList[PARTITION_MAX_NUMBER];// Partition parameter list

nSts = m_CameraControl->GetPartitionBlockList((int
*)m_nPartitionParamList,PARTITION_MAX_NUMBER);
```

Obtain and confirm the number of blocks in each partition of the camera by the GetPartitionBlockList function.

```
// Calculate the number of blocks of each partition (any size is specified to any partition)
m_nPartitionParamList[0] = 10;
m_nPartitionParamList[1] = 2;
```

As to the total number of blocks to be set on all partitions, the second argument obtained by the GetPartitionInfo function indicates the maximum number.

```
// Set up change of camera partitions
nSts = m_CameraControl->SetPartitionBlock(m_nPartitionParamList,2);
```

A change of partition information is set up in the camera by the SetPartitionBlock function. Right after partitions have been set up in a camera, the camera should show partition number [1] first.

See the reference manual for the reset value of member functions of each camera control class.

Subsection 3.4.3 Switching

When you record image or obtain recorded image in any of the partitions, you should set up the camera to allow for independent operation on each partition.

The following shows an example of program to change partitioning of divided memory:

```
// Obtain current partition number
nSts = m_CameraControl->GetPartition((int &)m_nPartition);
```

You confirm if change of partitions is possible and obtain the current partition number.

```
// Change partition position to be recorded in camera
nSts = m_CameraControl->SetPartition(2);// Set up partition number 2
```

After partition numbers are changed by the SetPartition function, the camera will record in a partition specified by the new number.

As to the argument for the SetPartition function, the maximum number, which was used to set the number of partitions in Subsection 3.4.1., shows the number that can be set as partition number.

See the reference manual for the reset value of member functions of each camera control class.

Chapter 4 Procedure for Camera Connection to Recording

Section 4.1 Examples of VisualC++6.0/VisualC++.NET Programs

An example of procedure of recording and obtaining recorded image using Camera Control Class is shown below:

(1) Declaration of Class
m_cameraControl = new CCameraControl(0);

(2) Initialization of Class
To initialize camera device.nSts = m_cameraControl->Init(1);

(3) Change Camera to LIVE Status
nSts = m_cameraControl->OnLive(TRUE);

(4) Set up Shooting Conditions
To obtain camera parameters
nSts = m_cameraControl->GetCameraParams((CAMERA_PARAMS &)m_CameraParams);

To set up recording rate
nSts = m_cameraControl->SetRecordRate(nRecordRate);

To re-obtain parameters due to change of list of resolution and shutter speed
nSts = m_cameraControl->GetCameraParams((CAMERA_PARAMS &)m_CameraParams);

To set up shutter speed
nSts = m_cameraControl->SetShutterSpeed(nShutterSpeed);

To set up resolution
nSts = m_cameraControl->SetResolution(dwResolution);

To set up trigger mode
nSts = m_cameraControl->SetTriggerMode(nTrigMode);

(5) Start Recording
To set record ready status on
nSts = m_cameraControl->OnRecordReady(TRUE);

To start recording
nSts = m_cameraControl->OnRecord(TRUE);

To confirm end of recording
m_cameraControl->IsRecord((BOOL &)check);

(6) Change Camera to PLAY status
nSts = m_cameraControl->OnLive(FALSE);

(7) Download first frame of image
m_cameraControl->TransferFrame(1,buf);

(8) End of Class
m_cameraControl->Exit();

www.photron.com

In Americas and Antepodes
PHOTRON USA, INC.
9520 Padgett Street, Suite 110
San Diego, CA 92126-4446, USA
Phone: 858-684-3555
Fax: 858-684-3558
E-mail: image@photron.com

In Europe:
PHOTRON EUROPE LIMITED
Willowbank House
84 Station Road
Marlow, Bucks SL7, UK
Phone:+44(0) 1628 89 4353
Fax: +44(0) 1628 89 4354
E-mail: image@photron.com

In other areas:
PHOTRON LIMITED
Chiyodafujimi BLDG.,
Fujimi 1-1-8, Chiyoda-Ku
Tokyo 102-0071, Japan
Phone:+81 3 3238 2106
Fax: +81 3 3238 2109
E-mail: image@photron.com

FASTCAM Control SDK Library "PccLib" Programming Manual
English Edition
January, 2003
Rev. 1.00