

6

fxLink

6.1 fxLink Overview

6.1.1 Basic Functions

fxLink has the following functions.

- MEMREACM f x camera control (Preview, Record, Playback, Download)
- Playback of downloaded images (MCFF), image quality adjustment, format conversion (AVI, TIFF, BMP, JPEG)
- Playback of image files (AVI, TIFF, BMP, JPEG)
- Coordinate measurement (camera preview images, downloaded images, image files)

Images can be zoomed and scrolled.

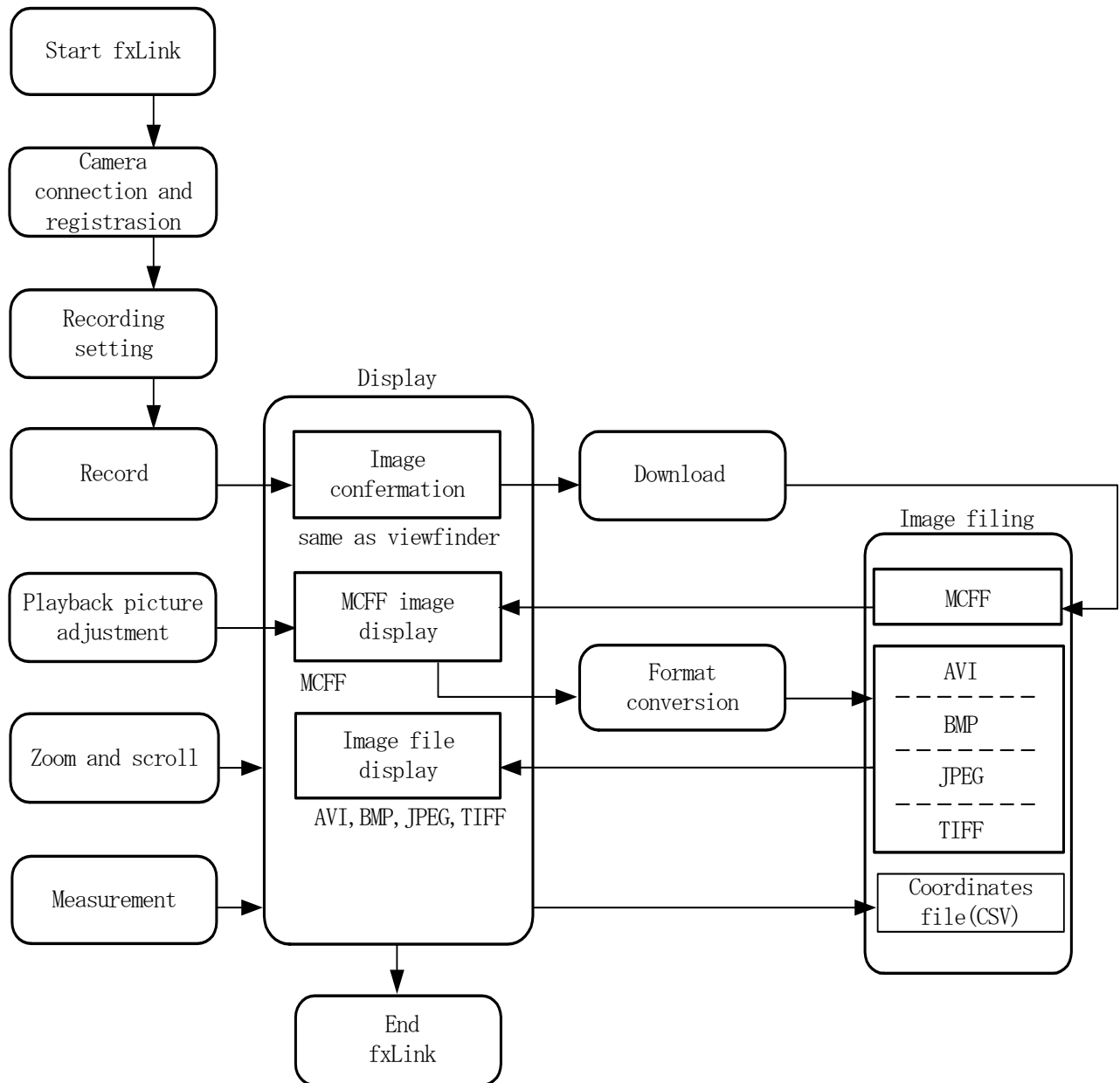
Thumbnails can be shown simultaneously of multiple item (camera or file) images specified.

Playback range and direction specified can be done in moving picture playback.

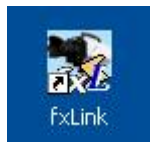
6.2 fxLink Operation

6.2.1 Operation Overview

An overview of the fxLink flow of operation follows.

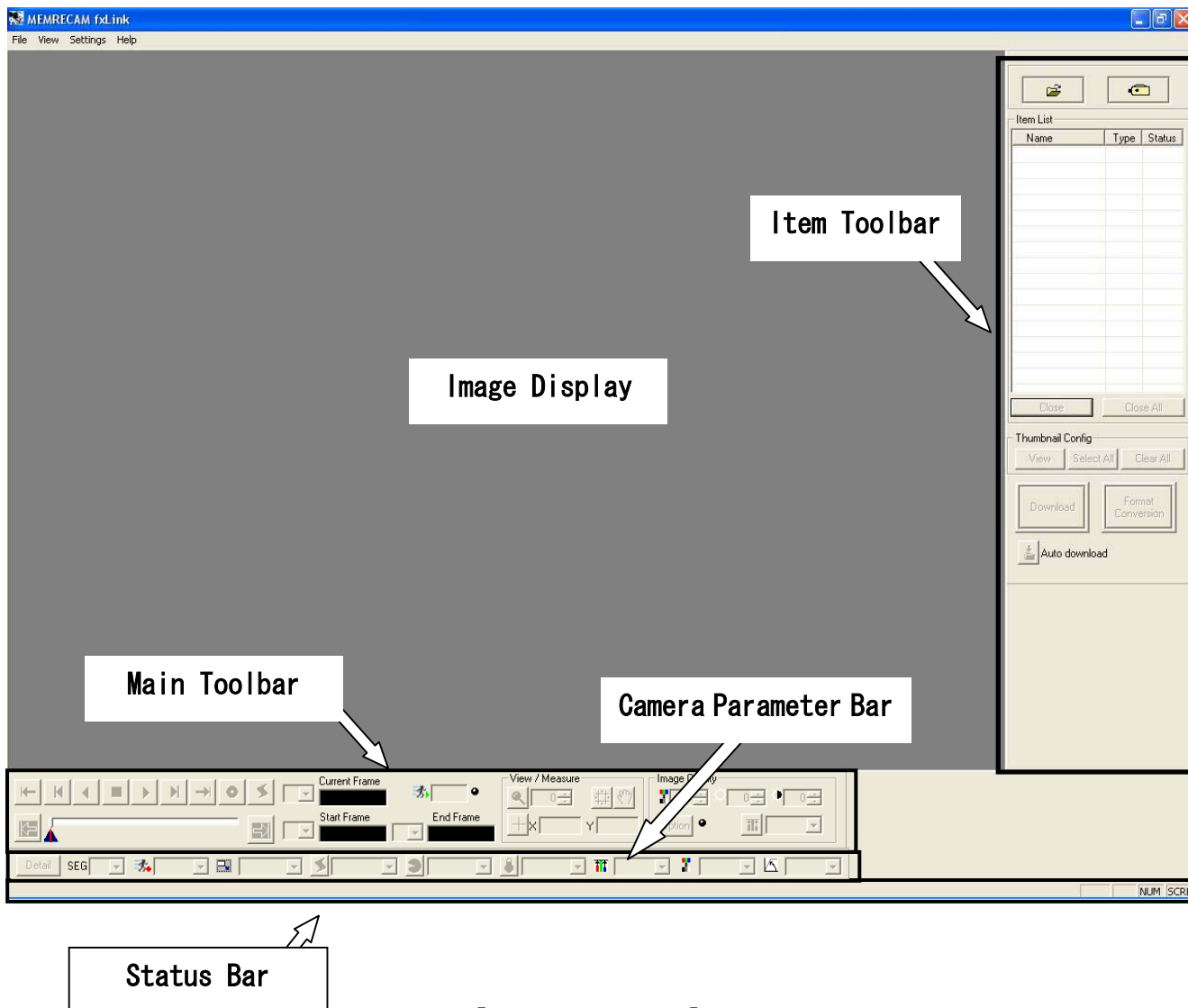


6.2.2 Startup



First, double click on the desktop “fxLink” icon.
Or select “Start” → ” All Programs” → ” MEMRECAM fxLink” →
“fxLink” .

FxLink startup screen appears as below.



[Startup Screen]

Caution



Before connecting the cameras, confirm the connection between the camera and PC (Ethernet/Fibre channel) and setting menu connection method are consistent.

Confirm that the camera and PC is properly connected.

Confirm the camera power is ON and the camera is started up.

For FC-AL connection, startup the PC after the camera is in the READY mode.

The PC does not recognize cameras if the camera is connected or started up after the PC has been started.

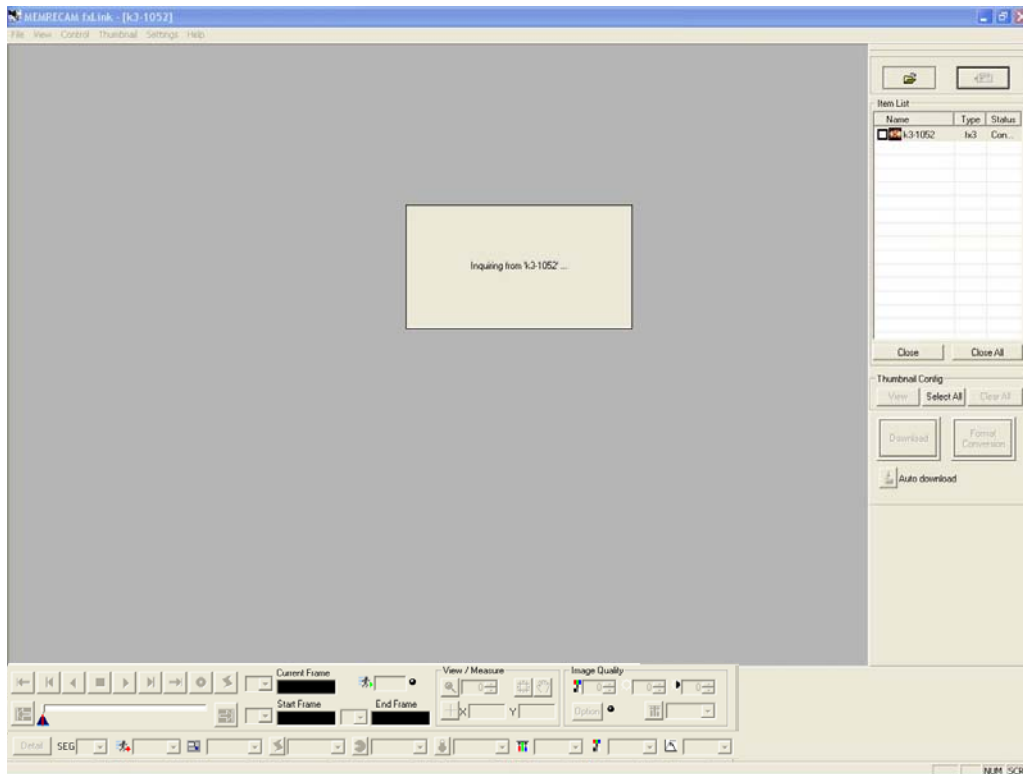
6.2.3 Camera Registration

To control the cameras (MEMRECAM fx) using fxLink, the camera must be registered. The registered camera information is saved in the settings file and used during camera connection.

Click on “Camera Registration...” on the “Settings” menu.

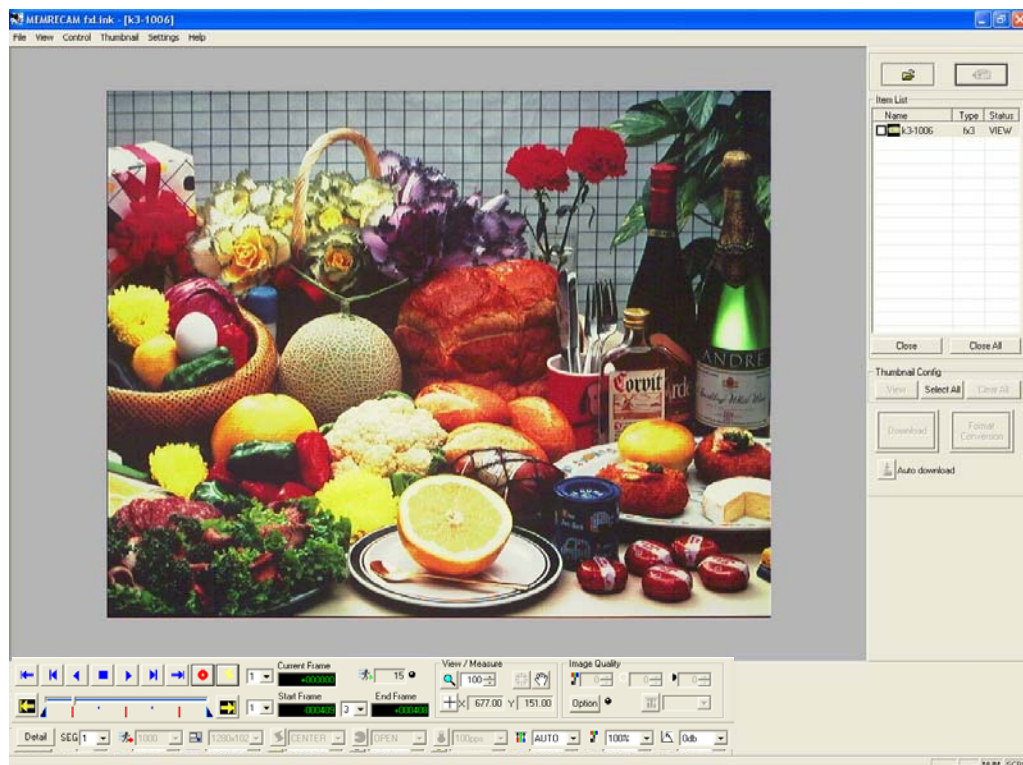


Camera registration dialog will be displayed.



Start “Camera connection” and the camera from the Item List will be added as a camera item.

The camera nickname, type and status will appear. The camera item status display is updated when the camera status changes and shows the camera status always. When camera connection finishes, the image display shows the camera image.



6.2.5 Toolbars

■ Item Toolbars

Add item



Open image files

Open image file to add file item to item list



Connect Camera

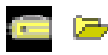
Connect to camera and add camera item to item list

Item List

Shows items (connected camera, opened image files).



Thumbnail setting checkbox



Item mark



Camera Item

Name

Camera nickname

Type

Camera type

Status

Camera Status



File Item

Name

Image file base name

Type

Image file type (mcf, avi, tif, bmp, jpg)

Close

Delete items from Item List.
If delete camera item then camera is disconnected.

Close All

All items deleted from the list



Thumbnail Settings

Items in thumbnail display are indicated with a check in the box on the left side of the item list.



Execute/Cancel thumbnail display



Select all items for thumbnail display



Cancel all item selection



Downloads image data (MCFF) from camera
Downloads image data recorded on the camera to a PC in MCFF format.



Format conversion of image data (MCFF)
MCFF files converted to AVI/BMP/TIFF/JPEG format and saved.



Performs settings of auto download
Conducts settings (setting for file name and range for saving) for auto download function (automatically downloads image after camera recording finishes).

■Main Toolbar

Tool for recording (camera only) and playback of items selected from the item list. Includes image zoom/scroll function, coordinate measurement function and MCFF image quality adjustment function.



Recording • Playback

- Camera recording control
- Camera image playback control (playback range, playback speed, loop, skip, forward/reverse)
- Image file (MCFF/AVI/TIFF/BMP/JPEG) playback control (playback range, loop, skip, forward/reverse)

Display • Measurement

- Displayed image zoom and scroll
- Displayed image subject coordinates (can set origin)

Image Quality Adjustment

- MCFF image quality adjustment

■Camera Parameter Bar

Sets parameters for camera recording/playback control.



■Status Bar

Displays detailed information regarding the buttons/display indicated by the cursor.

6.2.6 Menus

■File Menu

- Open Opens image file (MCFF, AVI, TIFF, BMP, JPEG)
- Close Closes image file (MCFF, AVI, TIFF, BMP, JPEG) displayed
- Select camera Connects camera
- Read parameter file Reads settings such as photographic conditions from the parameter file
- Save parameter file Saves settings such as current photographic conditions in the parameter file
- End application Ends fxLink application

■Edit Menu

- Close all Closes and cancels all items from the item list. Cameras connected are disconnected
- Select all Select all items for thumbnail display
- Cancel selection Cancel all item selection

■View Menu

- View parameter details Opens camera setting details dialogue box
- Properties Shows item property information
- Thumbnail view Display/hide thumbnail
- Main toolbar Display/hide main toolbar
- Camera parameter toolbar Display/hide camera parameter toolbar
- Item toolbar Display/hide item toolbar
- Status bar Display/hide status bar

■Control Menu

When there are no items on the item list, the control menu is not displayed.
Select an item from the item list and depending on the item, the control menu can be used.

○Camera Item

Camera control

VIEW/ARM, trigger, playback, loop playback, stop, reverse play, reverse loop playback, jump to top frame, jump to last frame, back 1 frame, forward 1 frame, set to playback start frame, set to playback end frame

- Coordinate measurement Starts/ends coordinate measurement
- Download Downloads image data (MCFF) from camera
- Auto download Downloads image data (MCFF) after recording completes
- Disconnect Disconnects communication with camera

○File Item (MCFF)

MCFF image file playback control

Playback, stop, jump to top frame, jump to last frame, back 1 frame, forward 1 frame, jump to trigger frame, set conversion start frame, set conversion end frame

- Coordinate measurement Start/end coordinate measurement
- Format conversion Converts MCFF data into a designated format image using current image quality settings and saves in file

○File Item (AVI, TIFF, BMP, JPEG)

Playback control of image file (AVI, TIFF, BMP, JPEG)

Playback, stop, jump to top frame, jump to last frame, back 1 frame, forward 1 frame, jump to trigger frame, set playback start frame, set playback end frame

- Coordinate measurement Start/end coordinate measurement

■ Image Menu

The image menu only displays items for MCFF files

- Gain/White balance/Enhance/Gamma/Chroma/Low pass filter
Sets MCFF image quality settings
- Custom white balance
Designates white or gray areas of the image display and conducts white balance adjustment on the image
- Luminance adjustment
Adjust MCFF luminance (brightness and contrast)
- Reset
Resets image quality adjustment performed with fxLink to the image quality settings recorded on the MCFF file

■ Setting Menu

- Camera registration
Shows the registered cameras connected with fxLink
- Connection method
Selects the connection method (TCP/IP, FC-AL) for camera connection
- Options
Performs other fxLink settings

■ Help Menu

- version information
Shows version information for the fxLink application

6.2.7 Setting Recording & Playback Parameters

Once the PC and camera connection has been established, the “Main Toolbar” and “Camera Parameter Bar” function.














Main tool bar recording & playback portion

Name and Application of Buttons Displayed

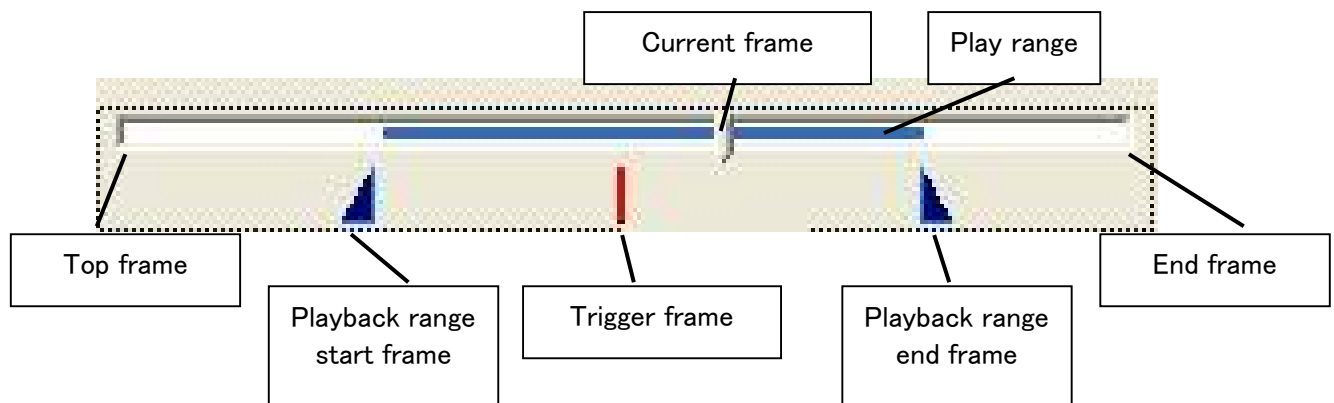
Buttons shown and their applications are provided below.

Use the mouse to click on the buttons to control the camera.

	GO TO START	Shows the playback start frame
	REV STEP	Back 1 frame
	PLAY	Reverse play /Reverse loop playback
	STOP	Stops play, VIEW, ARM mode and switches to READY mode
	PLAY	Play / Loop play
	FWD STEP	Forward 1 frame
	GO TO END	Shows the playback end frame
	VIEW / ARM	Changes to VIEW mode if in READY mode Changes to ARM (record) mode if in VIEW mode
	TRIG	Manual trigger during ARM mode Trigger frame display during READY mode
		Sets current frame as the playback range start frame
		Sets current frame as the playback range end frame

Playback Slider

Uses settings such as playback frame and range.



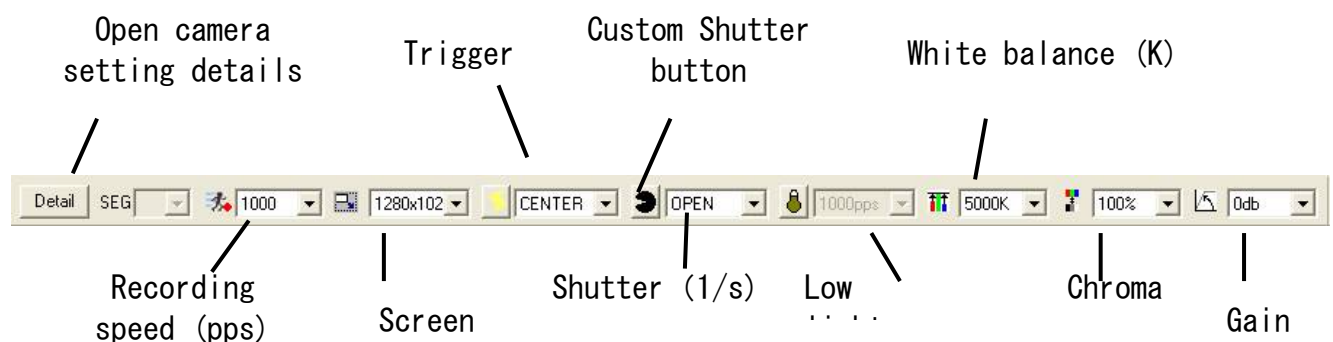
Playback Slider

Setting Recording Parameters

When the camera and PC are connected (camera status is “READY”) click the VIEW/ARM button on the “Main Toolbar” and it will switch to the “VIEW” mode and the item list Status will show ” VIEW” . A live image photographed by the camera will appear on the image display.

The image shown in the “image display” is the same as that shown in the optional viewfinder.

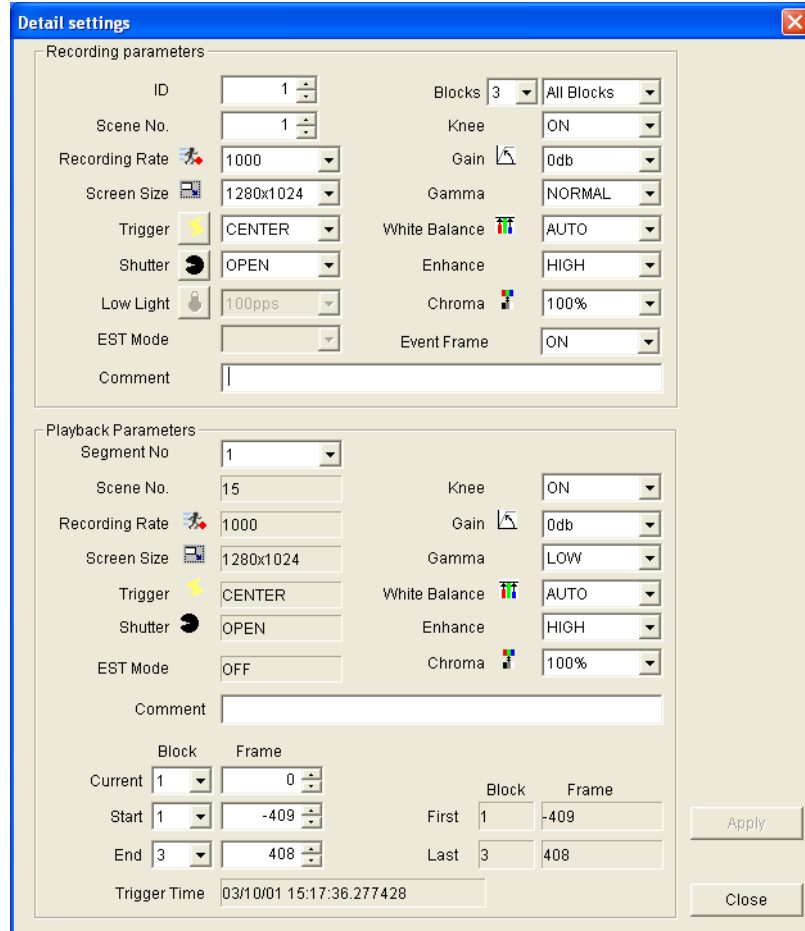
When the camera is in VIEW mode, recording parameters can be set with the ” Camera Parameter Bar” . (When the camera is in READY mode, the playback parameters can be set with the “Camera Parameter Bar” .)



Camera Parameter Bar

The “Camera Parameter Bar” buttons are used to set the main parameters such as camera recording speed during photographing.



Click  to open the “Camera Setting Details” dialogue and set all parameters.



Camera Setting Details Dialogue Box

Set the camera recording parameters and the image displayed (camera VIEW image) can be changed to match the parameters set.

Low Light Button


Depending on the parameters set, clear monitor image cannot be obtained in VIEW mode due to low light. Click on the low light button   on the “Camera Parameter Bar” to reduce the viewing speed of the image (brighter image) on the monitor and use to confirm the angle and focus.

(For actual image recording, the amount of light must correspond to the parameters set.)


The setting for this low light button only relates to the image display in VIEW and does not reflect actual recording conditions.

Actual recording is conducted according to the parameters set.

6.2.8 Recording

In VIEW, click on VIEW/ARM  again after confirming the parameters set for photography to start recording. The camera will switch to ARM and start recording to the memory.

When the camera is in ARM mode and a trigger signal is input from an external device connected to the camera, recording will end according to the recording parameter “Trigger” and switch to READY.

(Click the TRIG button  on the “Main Toolbar” to manually output the trigger)

6.2.9 Playback (Image Confirmation)

When recording ends and the camera status switches to READY, the playback range can be set on the playback slider. The playback range can be precisely set in single frame units by setting the playback parameters in “Camera Setting Details”. Other playback parameters can also be set. Designate the playback range, forward play, reverse play and loop play. Confirm the playback images and then confirm the range of data downloaded.

Display other still frame images recorded and confirm the image details.

Zoom and scroll can be performed on the still images selected with the “Zoom Scroll Tool”. The zoom or scroll set for the still images is saved in each playback mode (forward, reverse, loop) Zoom and scroll function during image display is not related to the download.

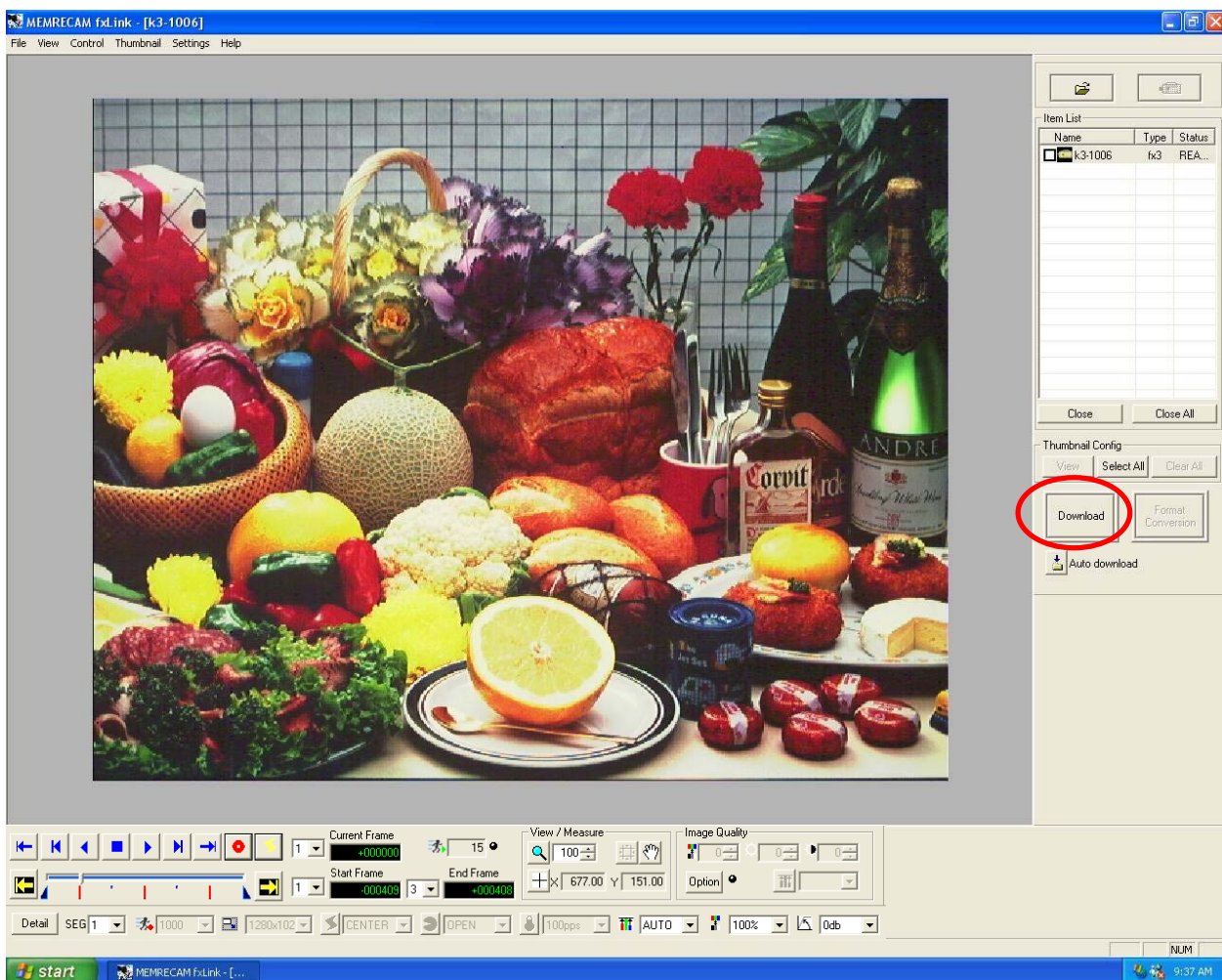
When downloading, the original recorded image is saved, regardless of the zoom or scroll display.

6.2.10 Image Downloads

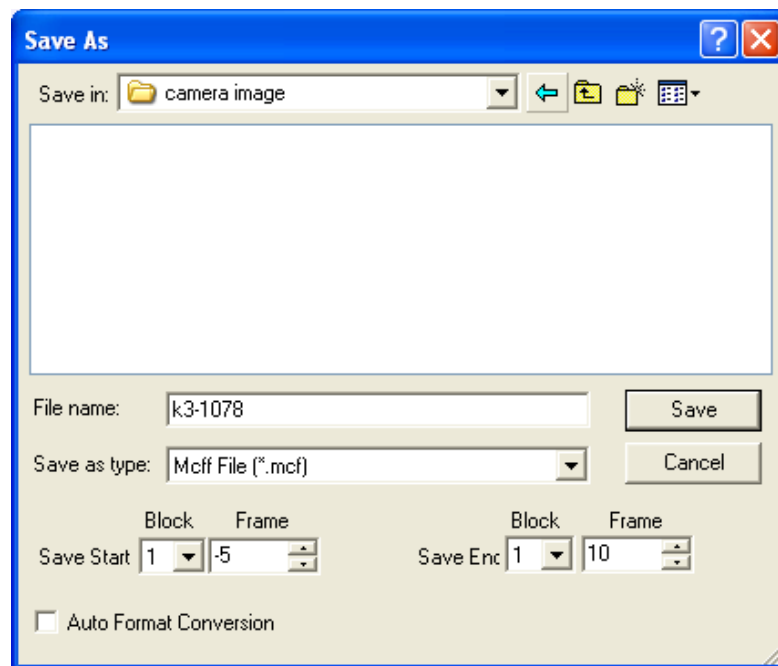
Determine the file name and range of data to be downloaded and then download the camera images. In image download, it may take longer time to download. The range can be set for the minimum required range.

With the recording parameter settings during photographing, the image size can be set smaller to condense the time requirements.

After setting the range, click "Download".



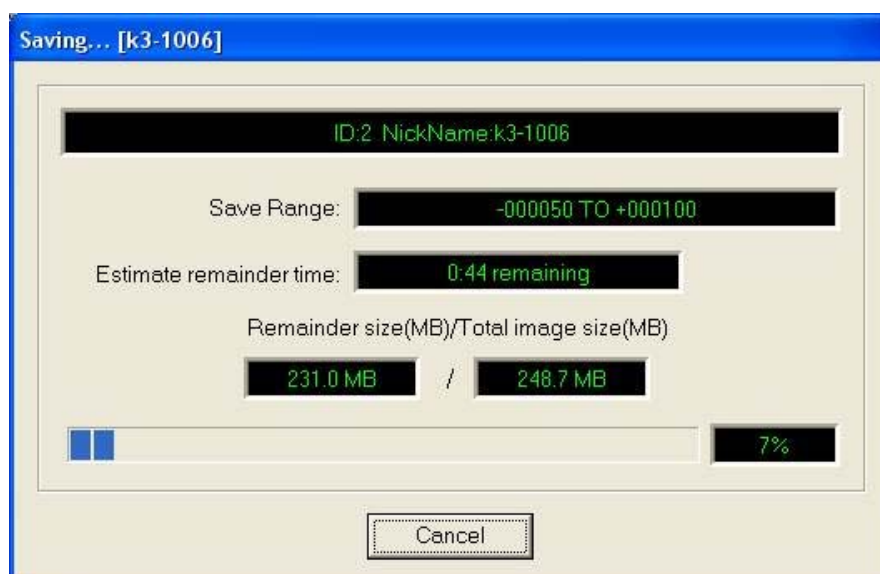
A dialogue box appears to set the storage location and file name for the downloaded image (MCFF format).



Download Dialogue

Input the file name. To indicate MCFF format, the extension “.mcf” is automatically added to the file name input. The camera playback range is set in the storage range downloaded. The storage range can be changed with this dialogue and then camera playback range is set to the same range.

Click the storage button and the download will start.



When image data download is finished, the file downloaded is automatically added to the item list. Select the image to show the image display.

The image file downloaded can be played using the buttons on the “Main Toolbar” that are the same as the camera.

6.2.11 Image Quality Adjustment

For the images filed, those in MCFF format can be adjusted for image quality using “Image Quality Adjustment Tool” for the image displayed.



Image quality part of main toolbar



Chroma



Brightness



Contrast



Custom White Balance

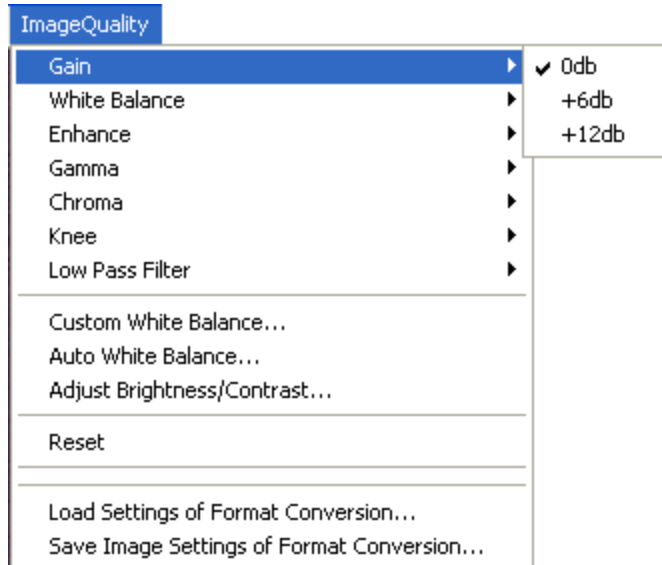


White Balance Selection

The image quality adjustment tool works for the image displayed but does not impact the MCFF image file.

After performing MCFF image quality adjustment, convert the format and the adjusted image can be saved in a converted format such as AVI and TIFF.

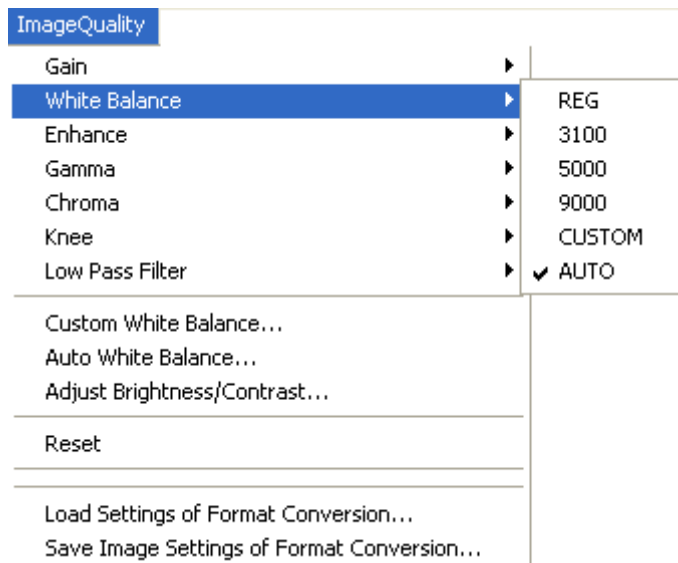
• Gain



Select from 0db, +6db, +12db.

0db is the standard, and +6db, +12db are for enhanced sensitivity.

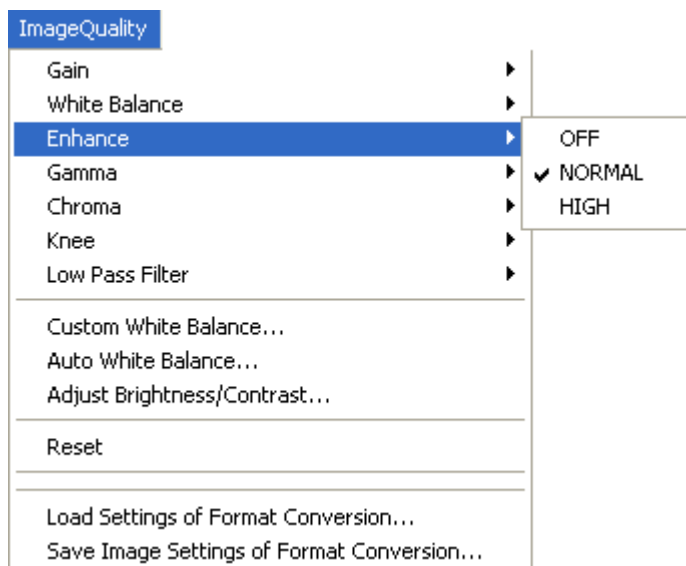
• White Balance



Select from 3100 (K), 5000 (K), 9000 (K), CUSTOM, AUTO.

Select to match the color temperature of the light source.

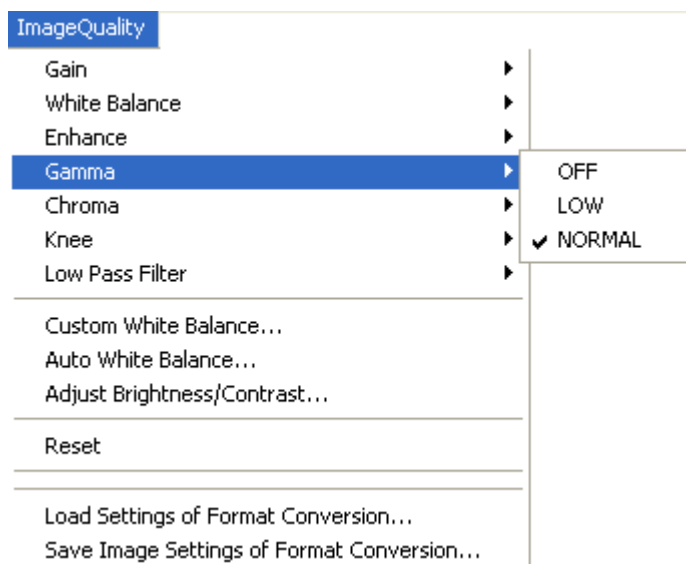
▪ Edge Enhance



Select from OFF, NORMAL, HIGH.

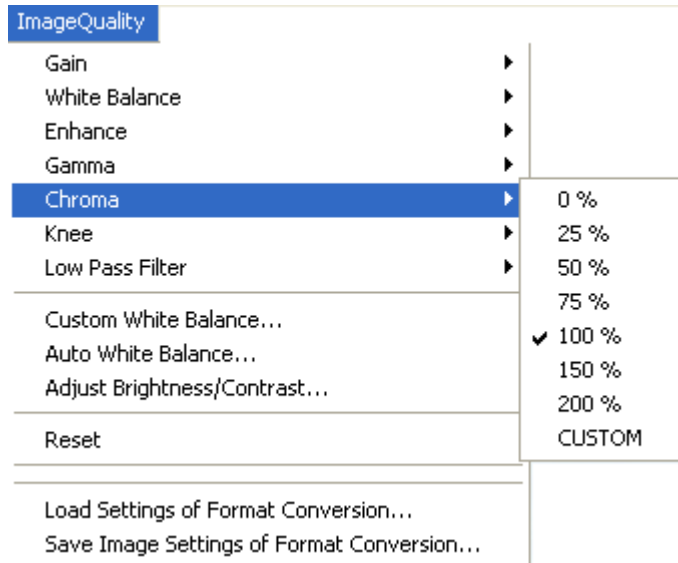
The Standard is NORMAL.

▪ Gamma



Select from OFF, LOW, NORMAL.

• Chroma

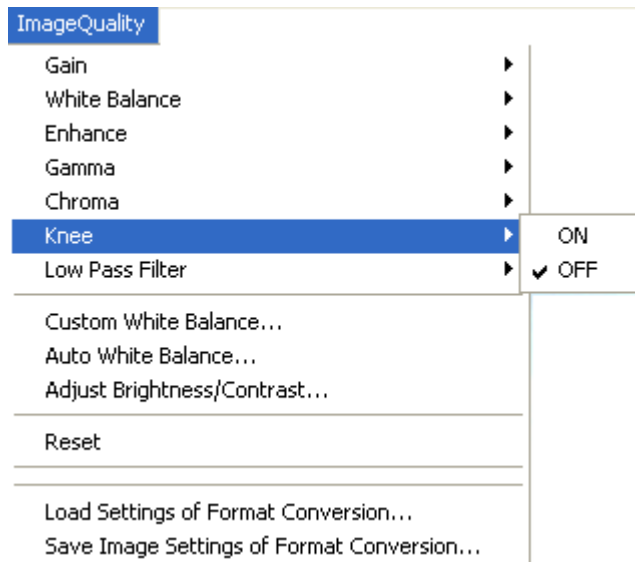


Select from 0%, 25%, 50%, 75%, 100%, 150%, 200%, CUSTOM.

0% indicates black & white image display.

The Standard is 100% color.

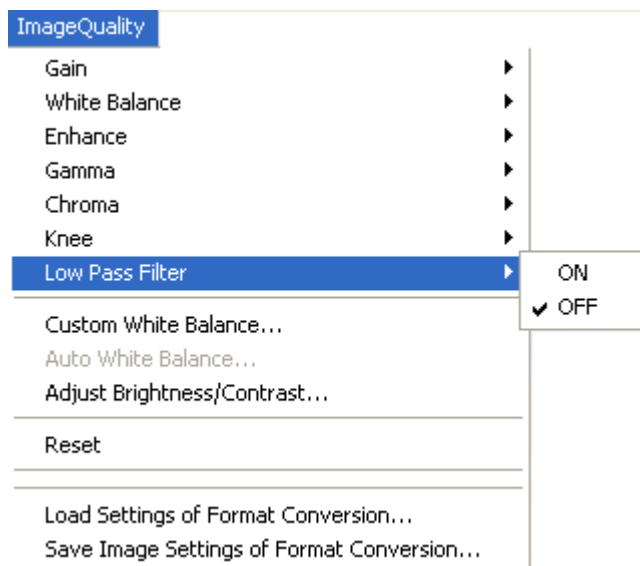
• Knee



Select from ON, OFF.

The Standard is OFF.

▪ Low Pass Filter



Select from ON, OFF.

The Standard is OFF.

▪ Reset

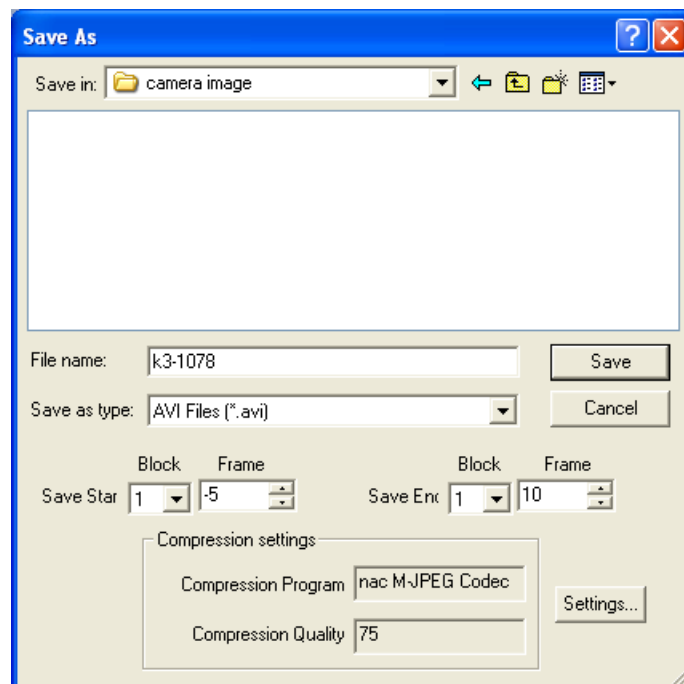
After resetting image quality adjustment, the setup returned to the setup being recorded in the MCFF file.

6.2.12 Format Conversion

Converts the format from the saved data (MCFF format) of the downloaded camera image into AVI、BMP、TIFF and JPEG.

Open the downloaded data (MCFF data) using “Open” from the “File” menu. The opened file name appears on the item list (Previously downloaded data appears on the item list when continually converting formats from downloaded camera images).

Select the MCFF data to be converted from the item list and click “Format Conversion” button to display the save conversion dialogue.



Designate the file name and file type (AVI, TIFF, JPEG, BMP) for saving the data after conversion.

An extension is automatically added to the file name to identify the type of file. Click " Save" to start format conversion and the progress dialogue appears.



Save the converted format data in a file and the file automatically opens to select and register to the item list. This converted image appears in the display. The converted image file saved can be played using the "Main Toolbar" .

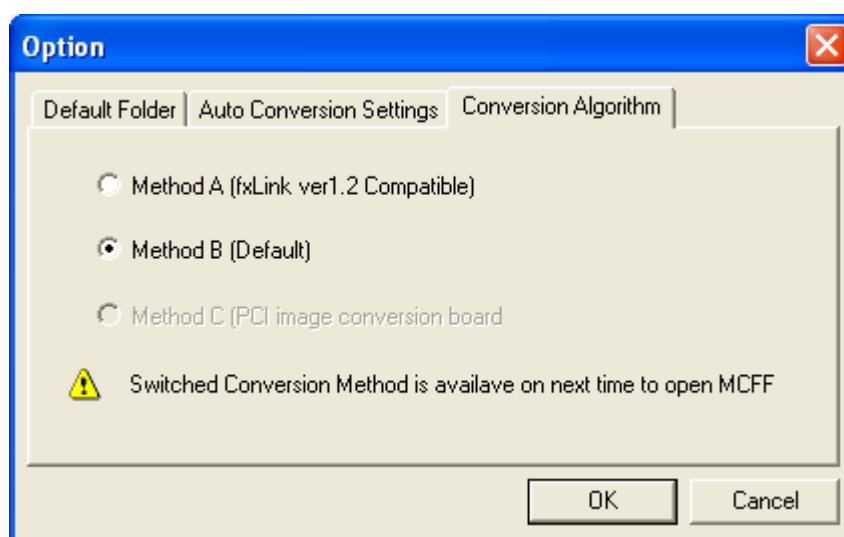
▪ **Conversion Algorithm**

Format conversion algorithm can be select.

Method A is a old type algorism and is compatible with older Smart Capture .

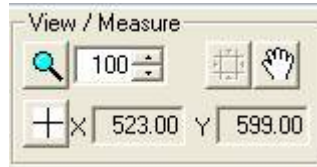
Method B is a new type algorithm and can get clear picture, small artifacts, good color, high contrast and high resolution. Method B is a default setting.

Method C uses an optional PCI image conversion board. Method C is converted at high speed, and converted image is quality like Method B.


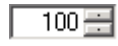


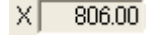



6.2.13 View / Measure

The image zoom/scroll, display coordinates of image focal point and coordinate data can be saved to the CSV file using the View/Measure button on the main toolbar.



Main Toolbar display/instrumentation

	Zoom tool	Designated area switches to zoom mode
	Zoom magnification	Zoom magnification
	Hand tool	Scrolls image
	Coordinate	Switches to coordinate measurement mode
	X coordinate	Cursor at X coordinate of image
	Y coordinate	Cursor at Y coordinate of image

Zoom

The three zoom methods include the point designation, the frame designation and the magnify designation.

- Point designation zoom uses the mouse to show the central point of the image. Click on Zoom to access the point designation zoom mode and the cursor changes to a zoom style. The left mouse button enlarges while the right mouse button shrinks.
- The frame zoom enlarges an area of the image displayed using the mouse. Click " Zoom tool" on the "View" menu and the framed area designated zooms to fill the " Image display" .
- The magnify designation range sets the exact magnification of the zoom box.

When using zoom to enlarge the image display, use the hand tool and scroll bar on the image display to scroll the image.

To return to the original magnification of the zoomed image, set the magnification of the zoom box to 100(%) and click on the zoom button. Select “Zoom 100%” on the “View” menu.

Note) The zoom/scroll function only functions for image display.

The effect of zoom or scroll has no impact on stored image data.

Coordinate Measurement

Select the item (camera image, image file) from the item list to display the image and move the cursor to the image display to display the X and Y coordinates of the image position on the main toolbar display. The X, Y coordinate origin position is set at the lower left corner of the image when the item is opened.


Press the coordinate measurement button to start saving coordinates to the CSV file. The starting position of the X and Y coordinates can be set for each item. Origin positions with modified settings are saved until the item is closed.

Modify the origin position and subsequent coordinate data displayed/recorded becomes the modified origin points.

Coordinate Measurement File Output

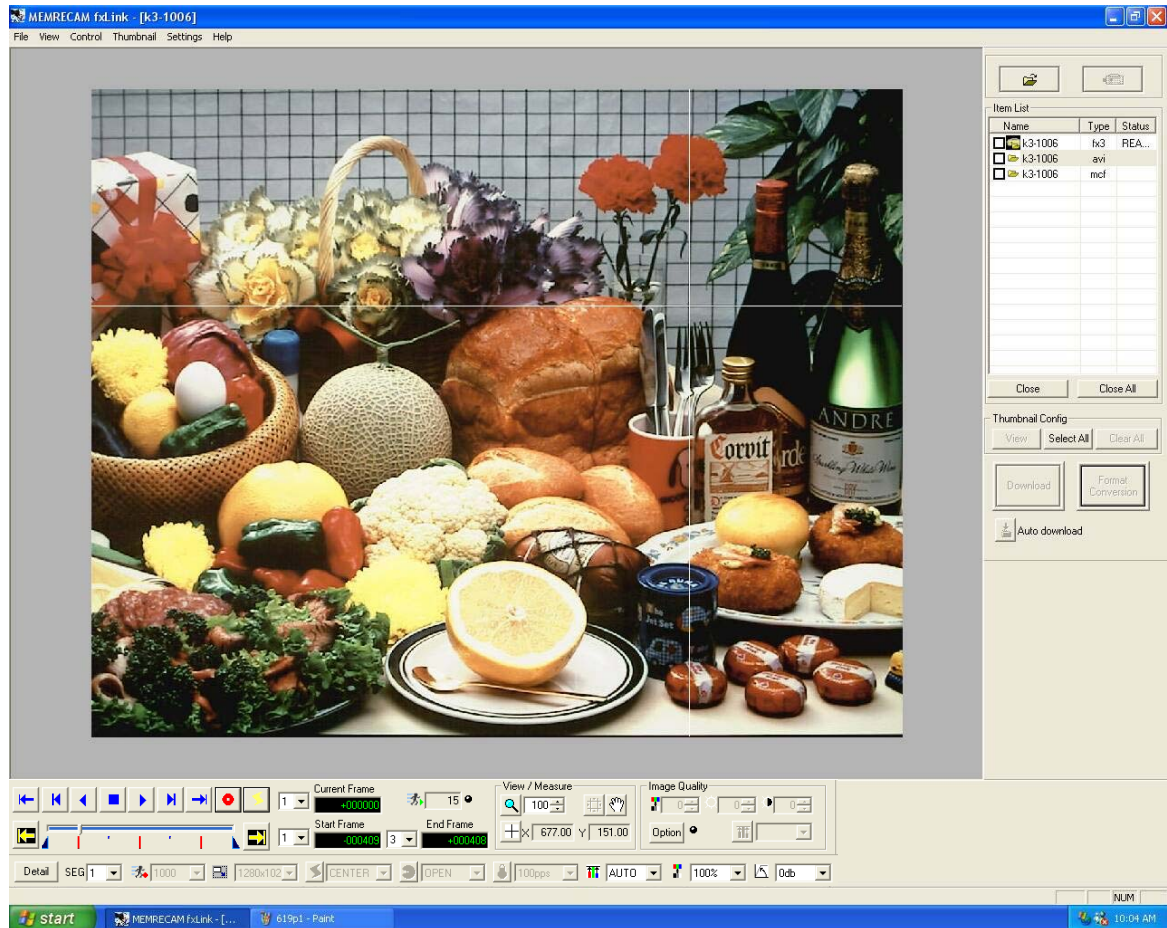
Designate the target point of the image with the mouse and the coordinates for that point will be output to the CSV file.


The procedure is as follows.

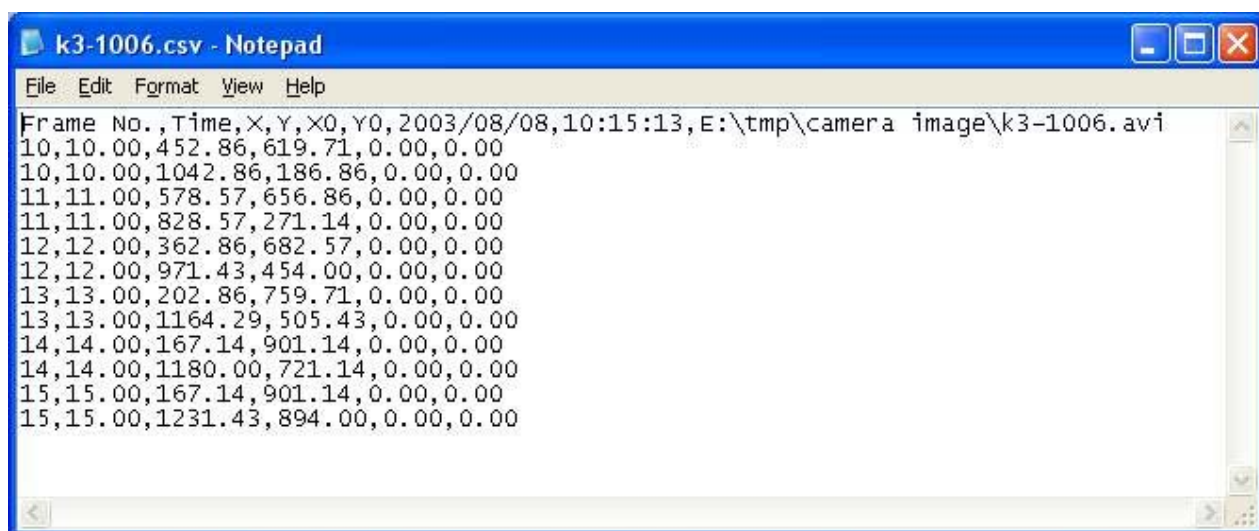
- ① Select the item from the item list and the image to be measured appears on the image display.
- ② Click the coordinate measurement button  to designate the CSV file name output.

- ③ If necessary set the origin point for measurement on the screen.

Right click on the mouse to move the cursor to the position where the origin point is to be set on the screen. The cursor position is set at the origin point and the X-Y axis is shown with a white line.



- ④ Click on the left mouse button to move the cursor to the target (measurement position) in the image.
The coordinates are saved in the CSV file for each click of the left mouse button.
Zoom to properly designate the target point.
(Even in zoom, the display/recording of the target coordinates is not affected)
- ⑤ Then, bring another frame to the screen and click the target in the same manner as above.
- ⑥ When the targets (measurement point) are designated, click again  to end coordinate measurement.
- ⑦ The created CSV file can be read with calculation software such as Memo Pad or EXCEL.



```
File Edit Format View Help
Frame No.,Time,X,Y,X0,Y0,2003/08/08,10:15:13,E:\tmp\camera image\k3-1006.avi
10,10.00,452.86,619.71,0.00,0.00
10,10.00,1042.86,186.86,0.00,0.00
11,11.00,578.57,656.86,0.00,0.00
11,11.00,828.57,271.14,0.00,0.00
12,12.00,362.86,682.57,0.00,0.00
12,12.00,971.43,454.00,0.00,0.00
13,13.00,202.86,759.71,0.00,0.00
13,13.00,1164.29,505.43,0.00,0.00
14,14.00,167.14,901.14,0.00,0.00
14,14.00,1180.00,721.14,0.00,0.00
15,15.00,167.14,901.14,0.00,0.00
15,15.00,1231.43,894.00,0.00,0.00
```

CSV file example opened by NotePad

Items stored on the coordinate CSV file

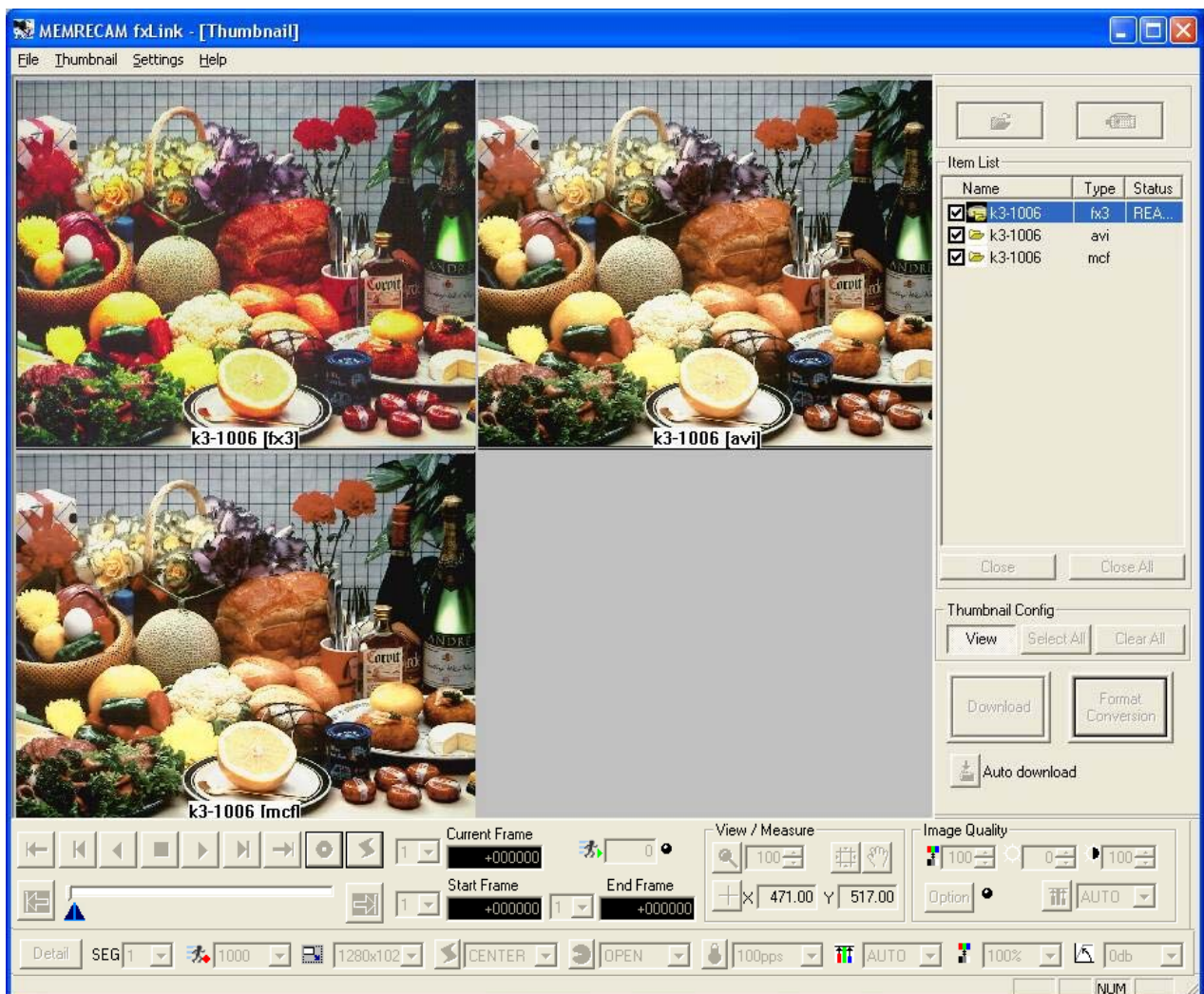
- | | |
|--------------------------|--|
| 1. Frame No. | frame numbers of the images with coordinate points |
| 2. Time | Relative time [msec] (frame0 is 0 msec) of the images with coordinate points |
| 3. X | X coordinate (base starting point is X0) |
| 4. Y | Y coordinate (base starting point is Y0) |
| 5. X0 | X coordinate of origin position (lower left corner of image is the standard) |
| 6. Y0 | Y coordinate of starting position (lower left corner of image is the standard) |
| 7. Date CSV file created | Time when coordinate CSV file was assigned title |
| 8. Item information | File name when image file, nickname when camera |

6.2.14 Thumbnail View

Open the image file to display the top frame image on the image display and register to the item list. Also, depending on the camera image download or format conversion of the downloaded data, the saved file can be automatically opened and register to the item list.

Select an image by checking the “thumbnail setting checkbox” on the Item List to select an image. Click on the thumbnail Config “View” to display the thumbnail of the selected image on the image display.

Click the thumbnail Config ” View” to end thumbnail display.

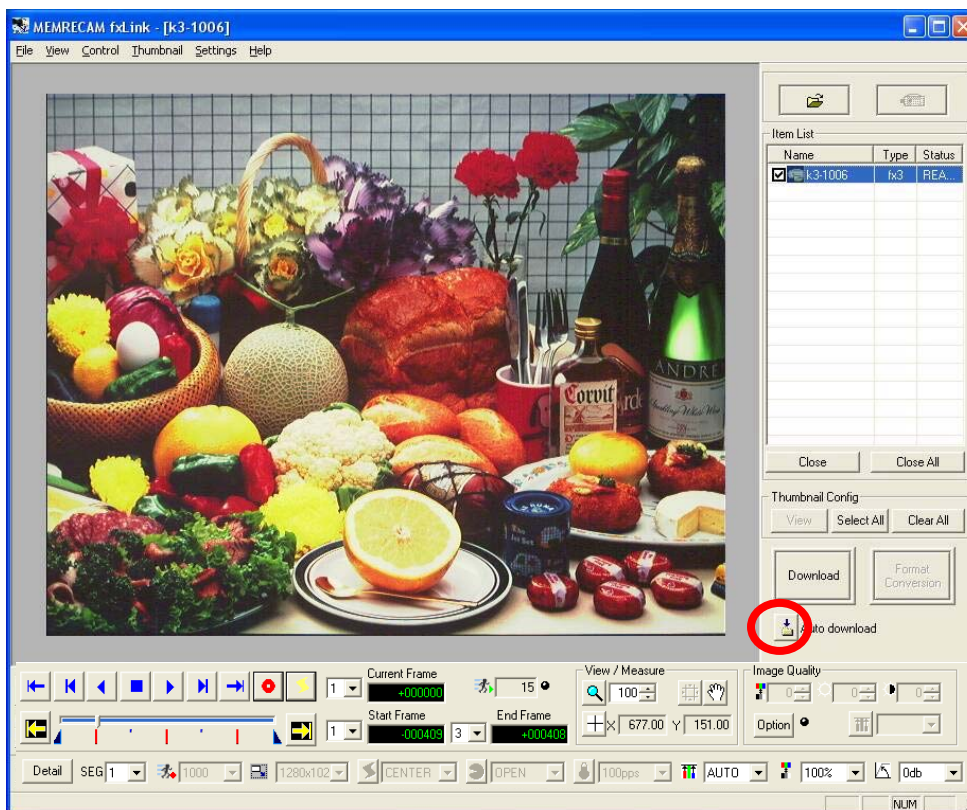


6.2.15 Other Functions

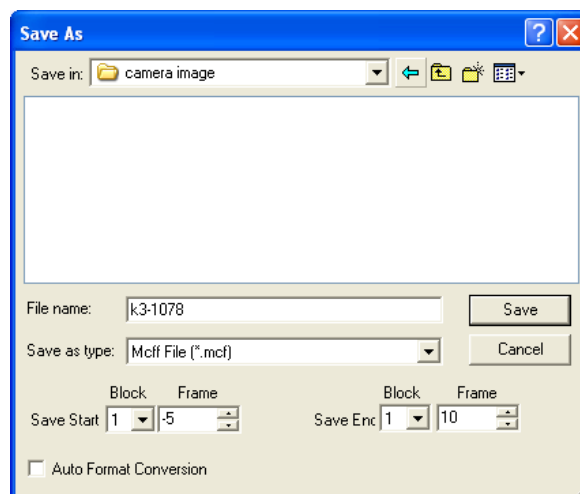
Auto Download Function

Automatic download function for recorded images when recording has ended according to pre-established settings.

After connecting the cameras, click on the “Item Toolbar”  .



When camera recording ends, the dialogue box appears to perform file settings for the download.



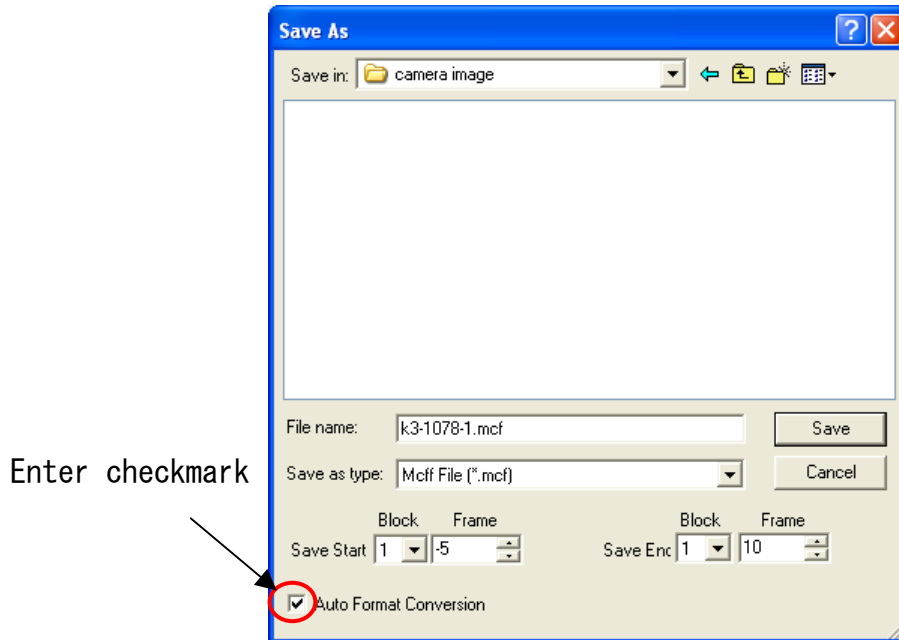
Set the file name and range of the download and click “Save” .

Start camera recording and the record-playback (set range) download is automatically performed. When it ends, the data is stored in a file name set in a set location and the downloaded file name appears in the item list.

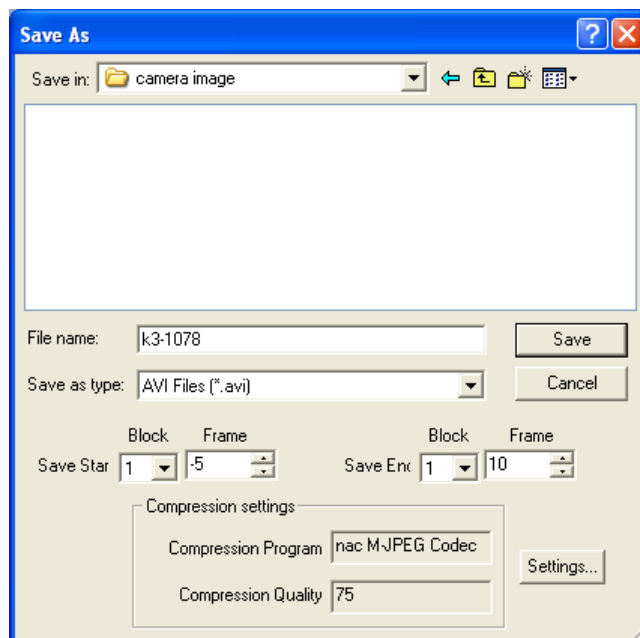
Auto Format Conversion Function

After download is completed, format conversion is automatically performed according to preset values.

During download, check the “Auto Format Conversion” box for the designated file name and range, and click “Save” .



Next, the save location of the format converted image and the file name setting dialogue appears.



When the settings for file type and compression are complete, click “save” .

The download starts and after the download is finished, format conversion begins.

When the download and format conversion are finished, the saved file is registered in the item list and the image is displayed.

6.3 fxLink Installation

6.3.1 Installation Procedure

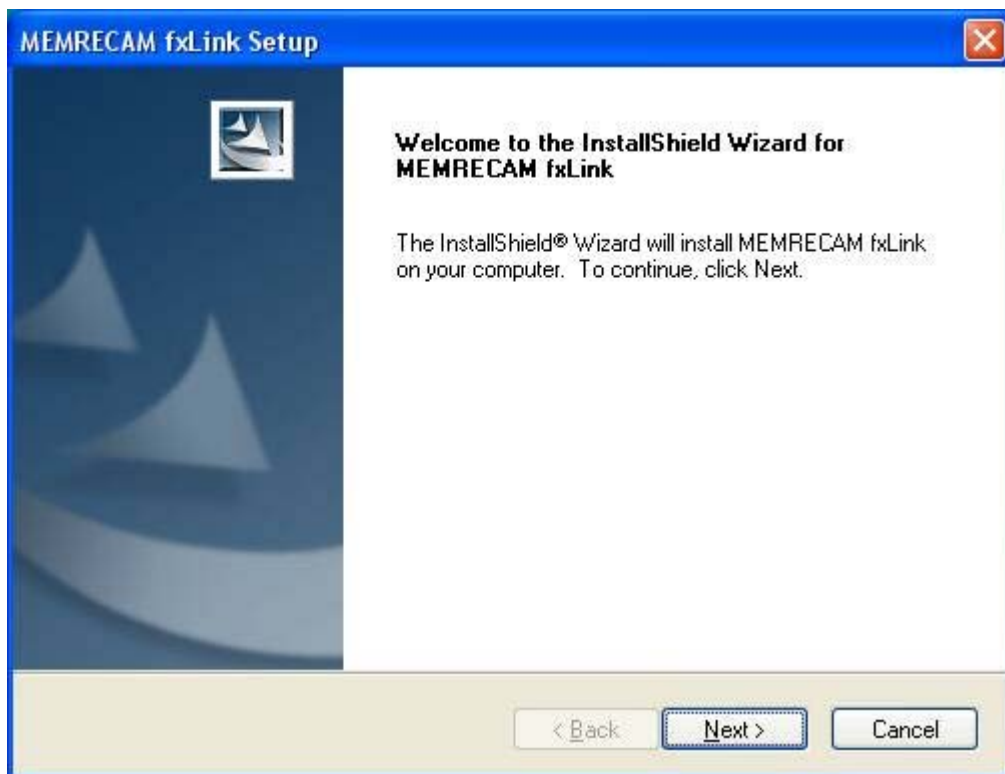
Log on as a user with rights to the Windows “Administrators” group.

No other applications running condition, insert the enclosed CD (MEMRECAM Smart Capture/fxLink) into the CD-ROM drive.

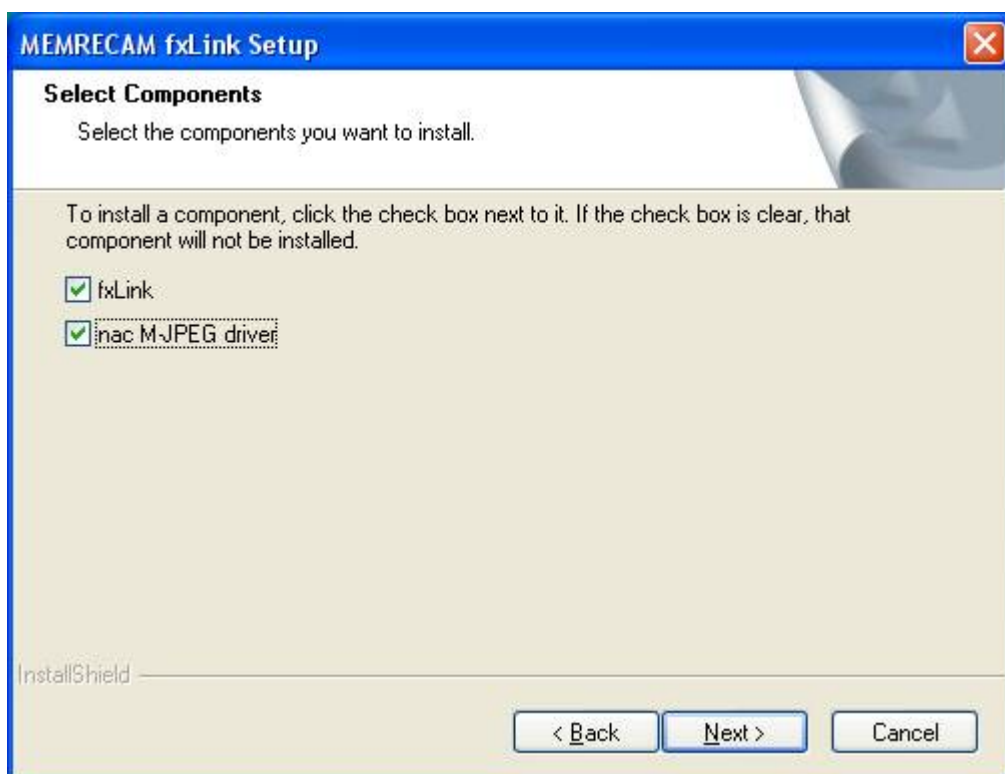
Automatic installation of MEMRECAM fxLink will begin.

■For FC-AL connection, before installing MEMRECAM fxLink, it is necessary to install the FC-AL host bus adapter on the PC and install the drivers.

When installation begins, the following will be displayed.



Click “Next(N)” and installation will begin.



Check on the components to be installed and press “Next>” .

Components not installed can be installed later.

Refer to “6.3.2 Procedures to Add and Remove Programs”

Hardware Confirmation dialog displayed

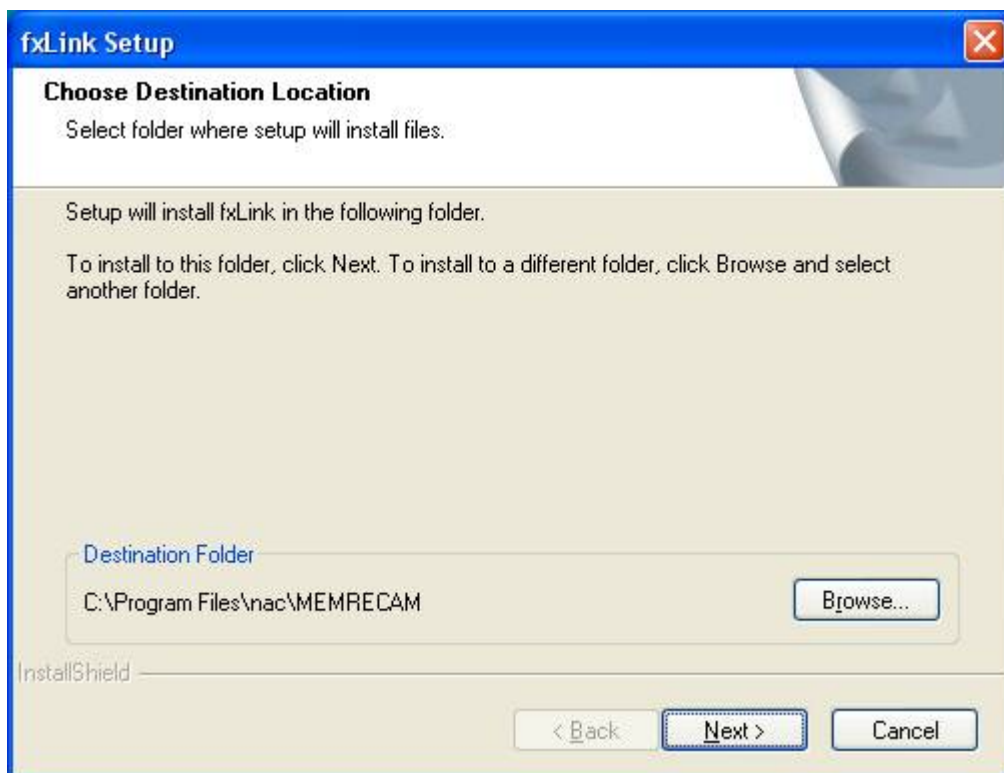


■For FC-AL Connection

The FC-AL connection hardware confirmation dialogue box will appear. Click “Yes (Y)” .

■For TCP/IP connection only, without FC-AL connection, click “No (N)” .

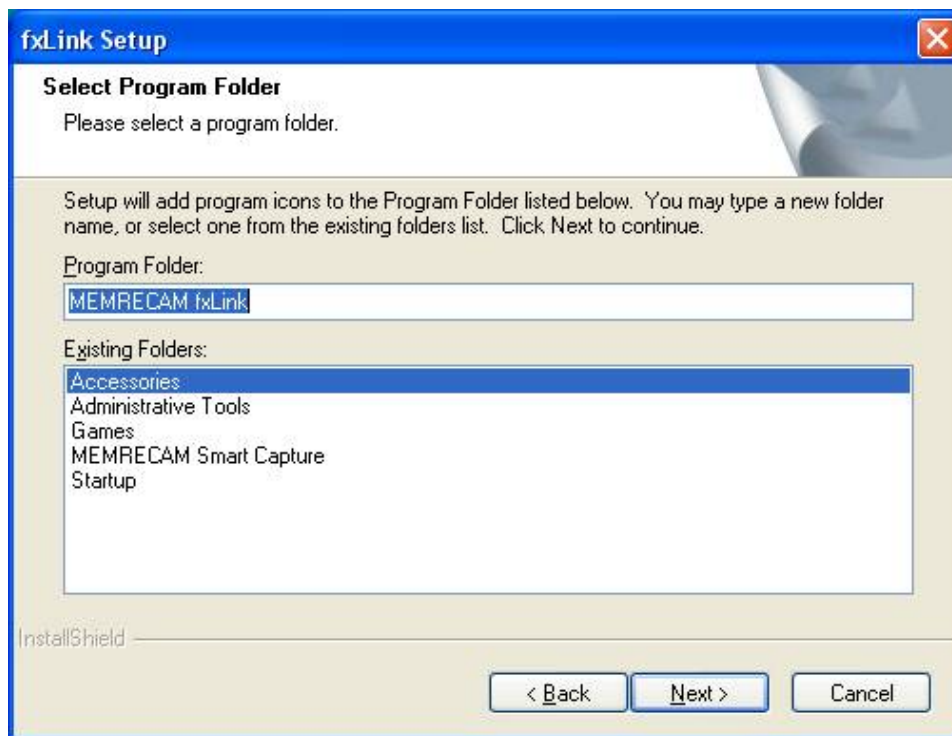
Choose Destination Location displayed



When modifying the drive and file path for the program to be installed, click “Browse...” to set.

Click “Next” .

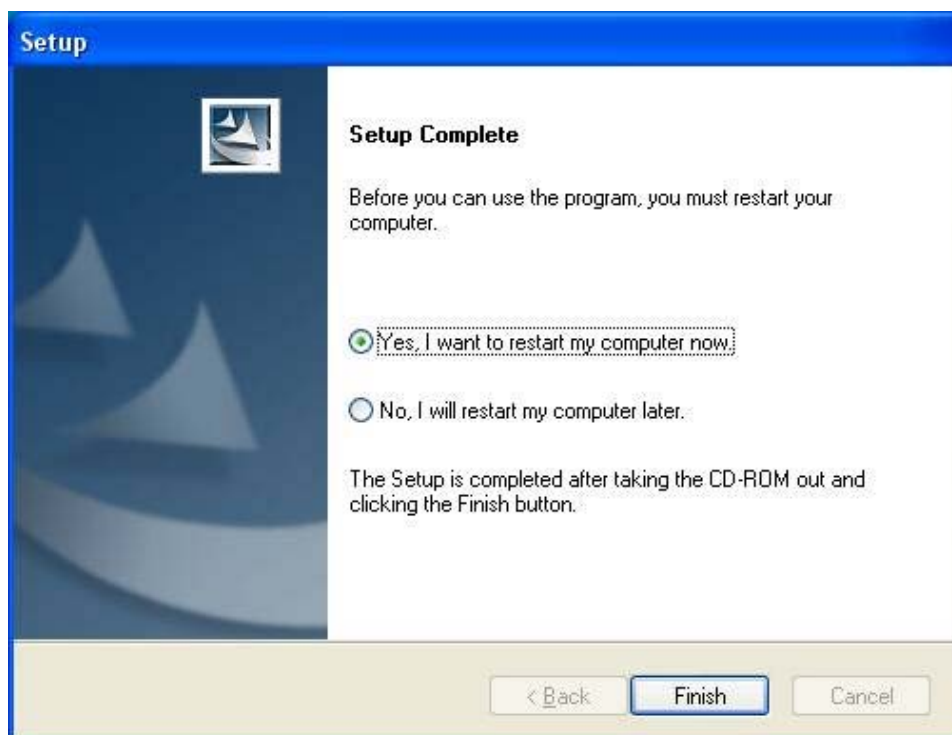
Select Program Folder displayed



If necessary designate the program folder name.

Click "Next>"

This manual explains the default program folder designation as an example. When designating a different folder, the startup menu display will differ from this one.

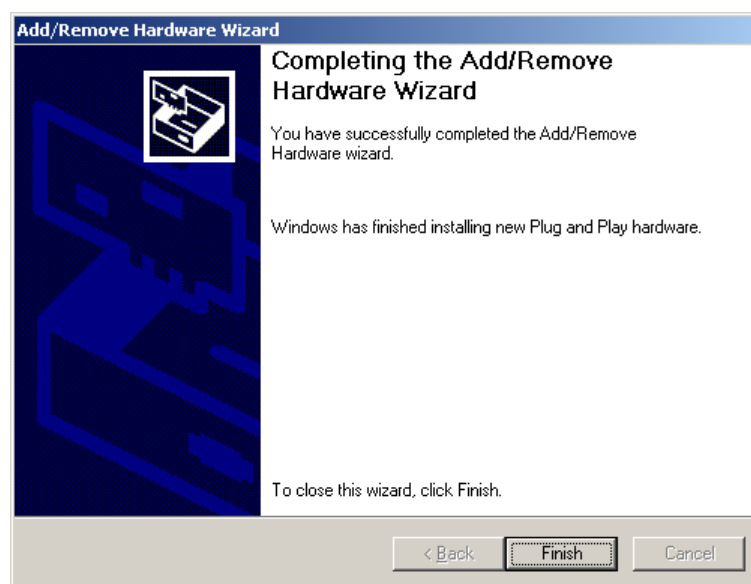
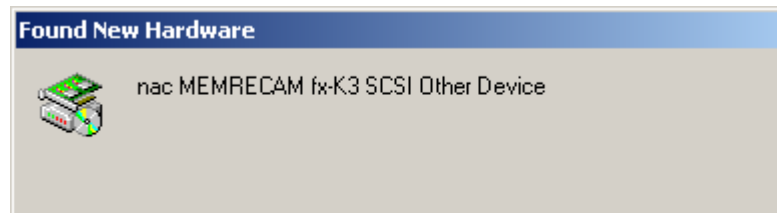


After several minutes, the installation will be complete. Click "End" .
It is necessary to restart the computer before using the program.

■ Hardware Identification

For FC–AL camera connection with Windows 2000/XP and Windows detects a new camera, “New Hardware Detection Wizard” will be displayed for driver installation.

○ Windows 2000

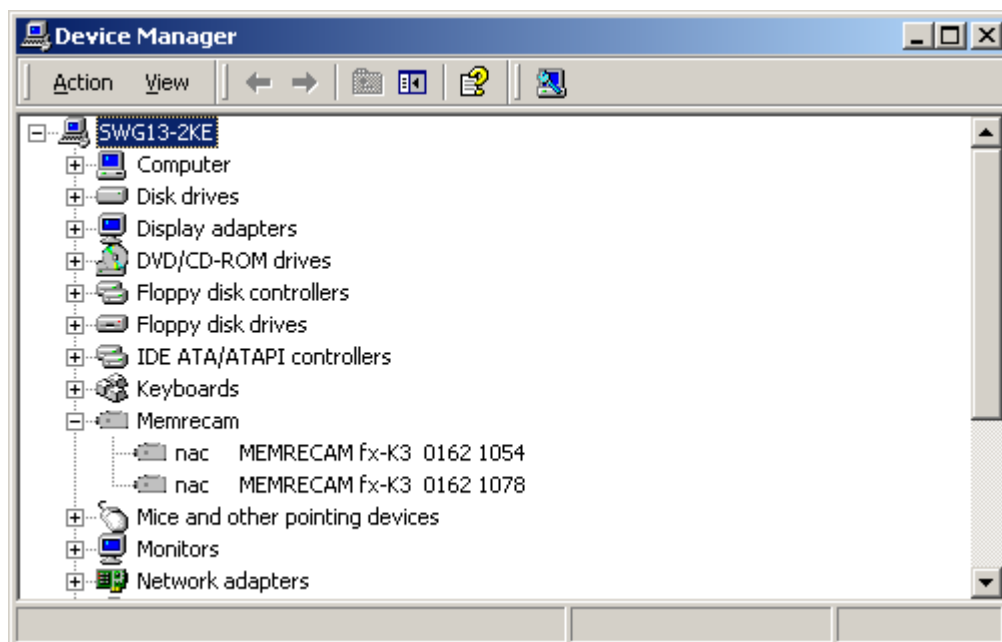


Press “End” and the dialogue box to restart the PC will appear.

With one new camera connected, restart the PC.

With two or more new cameras connected, confirm all of the cameras and then restart the PC.

After restarting the PC, confirm that the cameras are connected with the device manager.



OWindows XP



Press “Next (N)>” and the driver will install on the system.

When installation is complete, the “New Hardware Detection Wizard” will be complete.

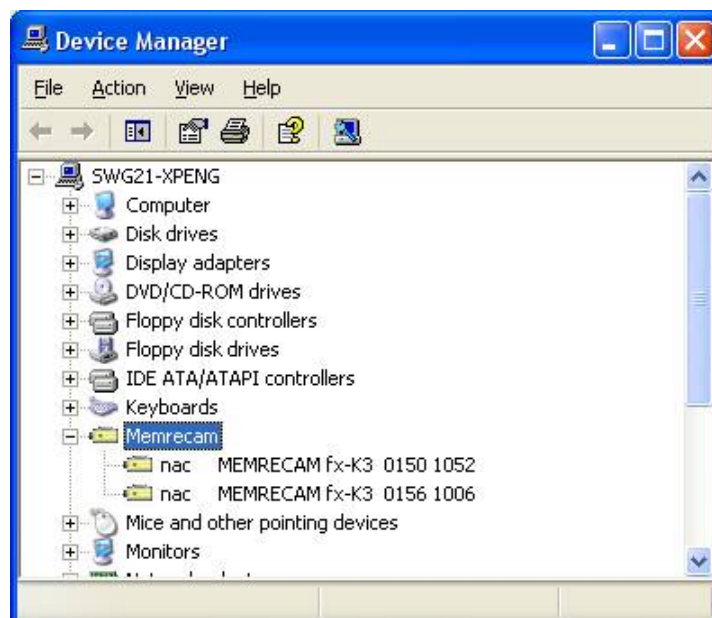


Press “End” and the dialogue box to restart the PC will appear.

With one new camera connected, restart the PC.

With two or more new cameras connected, confirm all of the cameras and then restart the PC.

After restarting the PC, confirm that the cameras are connected with the device manager.



6.3.2 Procedures to Add and Remove Programs

Uninstall MEMRECAM fxLink if not needed.

Even if MEMRECAM fxLink is uninstalled, the saved data will not be deleted.

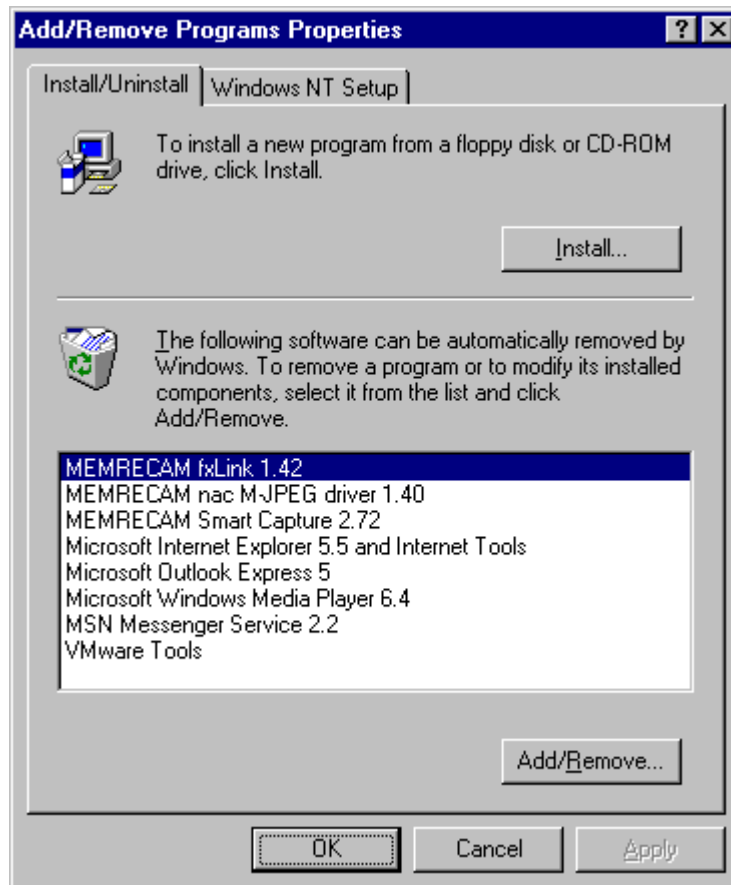
Components not initially installed can be added.

■ Procedures to Add and Remove Programs

Log on as a user with rights to the Windows “Administrators” group.

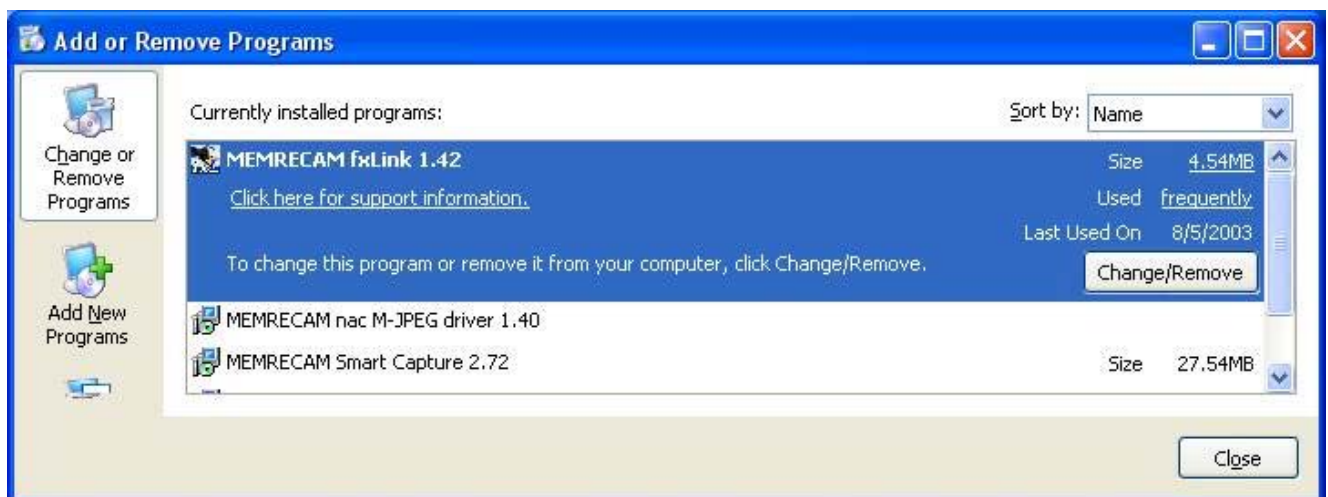
Open “Control Panel” , and click “Add and Remove Applications” (For Windows XP, click “ Add and Remove Programs “) ,when other applications do not running.

○Windows NT 4.0

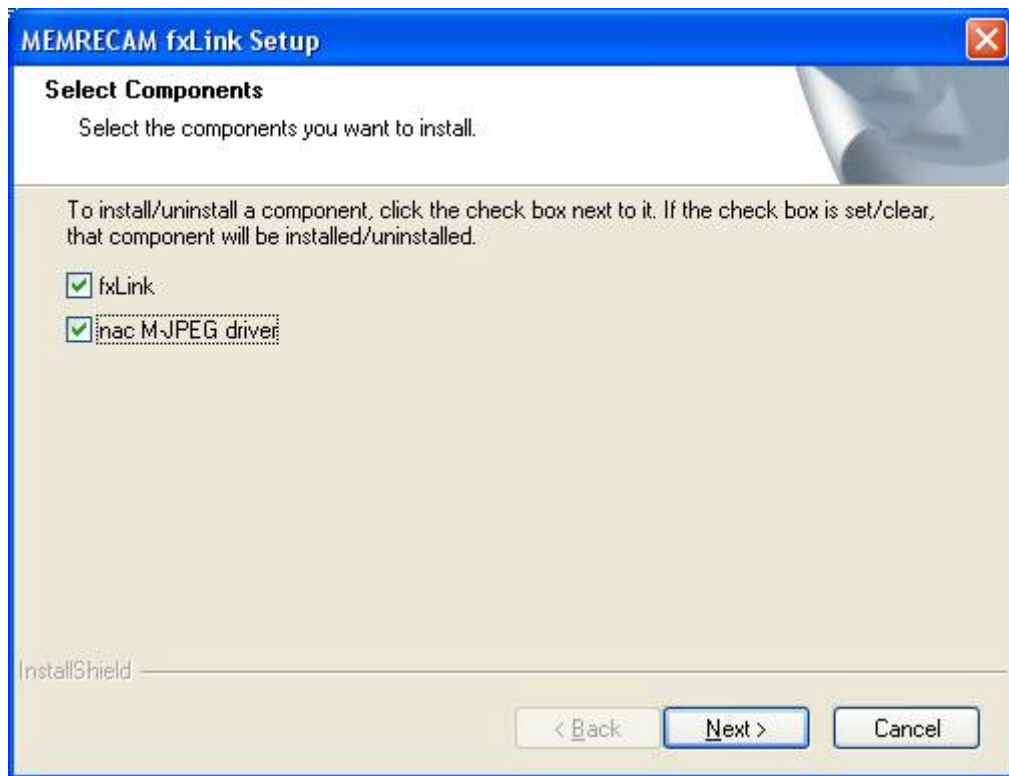


Select “MEMRECAM fxLink” from the list on the “Installation and Removal” page and click on “Adding and Removing (R)” for “Select Component”.

○Windows 2000/XP



Select “MEMRECAM fxLink” from the list on the “Current Programs Installed” and click on “Modify and Remove” for “Select Component”.



Check the components currently installed on the PC.

Remove the check from components to uninstall.

Check components to be installed.

Press “Next (N)>” to start adding components or start uninstall.

6. 4 fxLink Specifications

6. 4.1 Required Computer Conditions

To operate fxLink, the PC conditions are as follows.

Computer	IBM PC compatible (DOS/V)
CPU	Pentium II 200MHz or greater (with MMX) (recommend Pentium III 750Mhz or greater. Compression and display processing speed depends on the CPU performance.)
Memory	128MB or greater (recommend 256MB or greater)
Display	Full color, screen size 1024x768 or larger (recommend 1280x800 or larger)
OS	Windows NT 4.0 Service Pack 5 or higher Windows 2000 Professional Windows XP Professional Internet Explorer 5.0 Service Pack 2 or higher
Disk	35MB for program 512MB or greater (recommend 20GB or greater) for data (depends on the number of cameras and frames saved)
Network	Ethernet (IEEE802.3u 100BASE-TX)
CD Drive	1 (for installation)
Mouse	1
Keyboard	1

Compression and display processing speed depends on the CPU performance. There should be a sufficient amount of free space for disk data in applications.

There may be times when this product does not function properly due to computer configuration or version other than those conditions listed above. (Contact us for recommended equipment)