User's Manual

M-CAM-C / M-CAM-D

PLEASE READ THIS MANUAL CAREFULLY BEFORE OPERATION

Table of Contents

Computer Specification：

The computer system needs to meet the following requirements

configuration	requirements
CPU	Intel intel core 2 duo E2140
Memory	2 GB
Available Hard Disk Capacity	1 GB
Display	17 inch（screen resolution 1280×1024，24/32 true color）
Operating System	Windows® XP,WIN7,VISTA

Software Installation

1. Place your CD into your CD-Rom/DVD-Rom.

2. Double-click [MRC SETUP EN Setup Application] to bring out the installation dialogue box.

3. Click *Next*. (as on table 1)

Table 1

4. Choose I agree, and then click *Next*. (as on table 2)

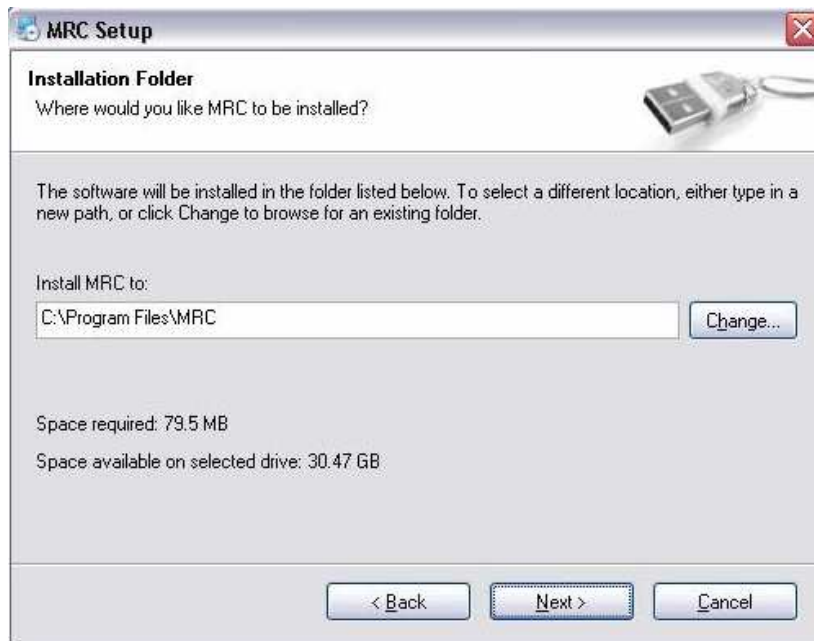Table 2

5. Click *Next.* (as on table 3)

Table 3

6. Choose" *Install shortcut for current user only*" and then click *Next*. (as on table 4)

Table 4

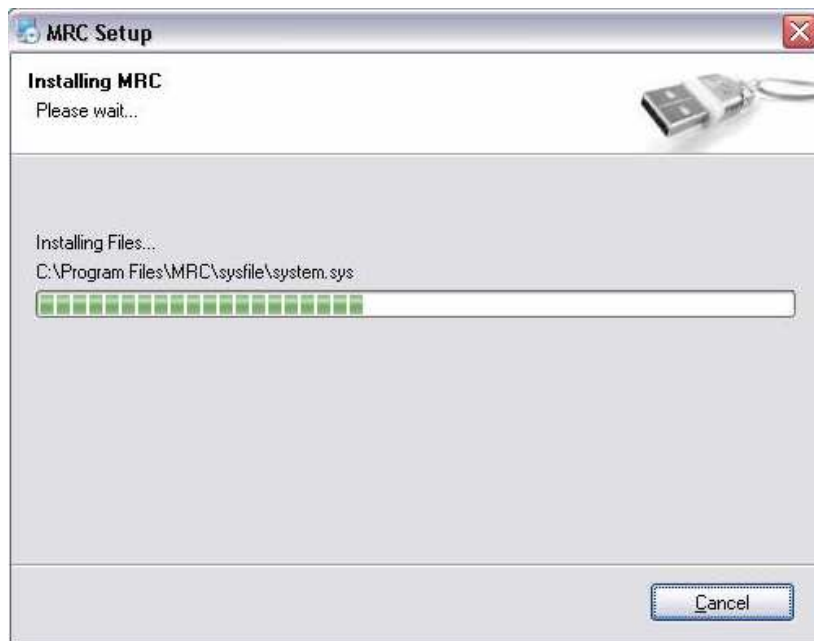7. Wait until the installation will finish (as on table 5)

Table 5

8. Click *Finish*. (as on table 6)

Table 6

Finish installation. On the desktop is generated, which could be clicked to run.

Setup Guide

Driver Installation

1. Place your CD into your CD-Rom/DVD-Rom.

2. Connect your camera to the computer's USB port

3. Choose "*Install from a list or specific location (advanced)*"and click *next.* (as on table 7)

Table 7

4. Click *"Browse",* navigate to the library drivers in your CD, choose the correct driver for your camera model, and then click *"OK"*. (as on table 8)
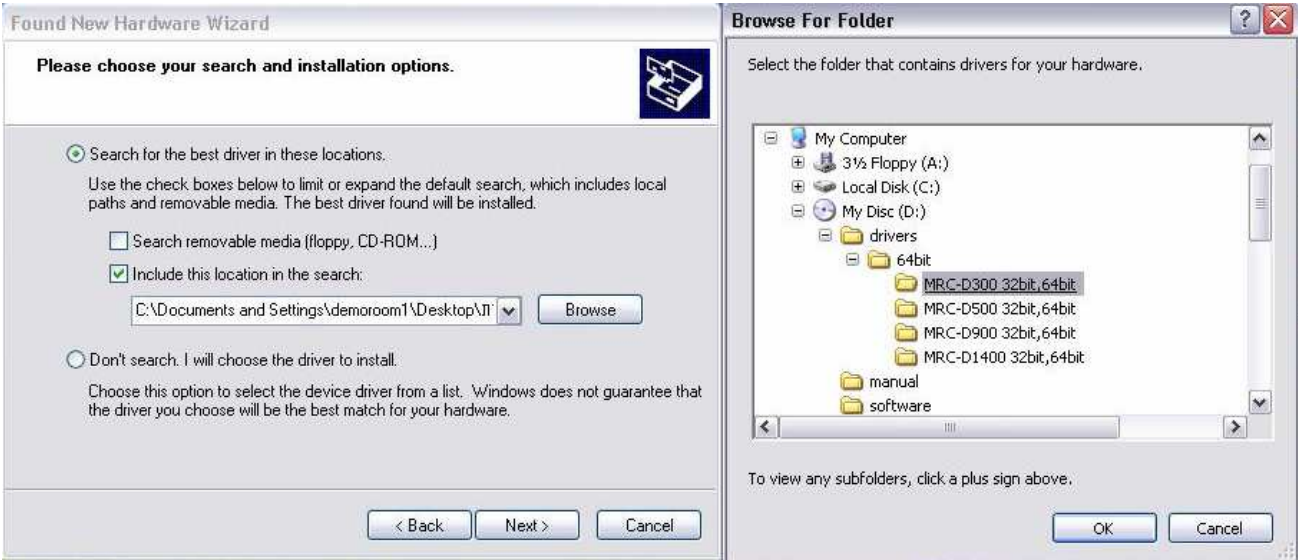

Table 8

5. Click *"Next"* ,(as on table 9)

Table 9

6.   Click *"Continue Anyway".* (as on table 10)

Table 10

7.   Wait until the installation will finish and then click "*Next*" (as on table 11)

Table 11

8. Click *"Finish*", finish the installation of camera driver. (as on table 12)

Table 12

Operating Interface

Start

1. Connect the camera to the computer.

2. Turn on the microscope light, and switch the light path into the camera.

3. Double-click on the desktop to start the program.

4. Click *Open Device* in *File* list and choose devices, such as D300 of Mshot. Preview the pictures of microscope in Main Window. Enable the devices priory used to be opened by default. (as on table13/14)
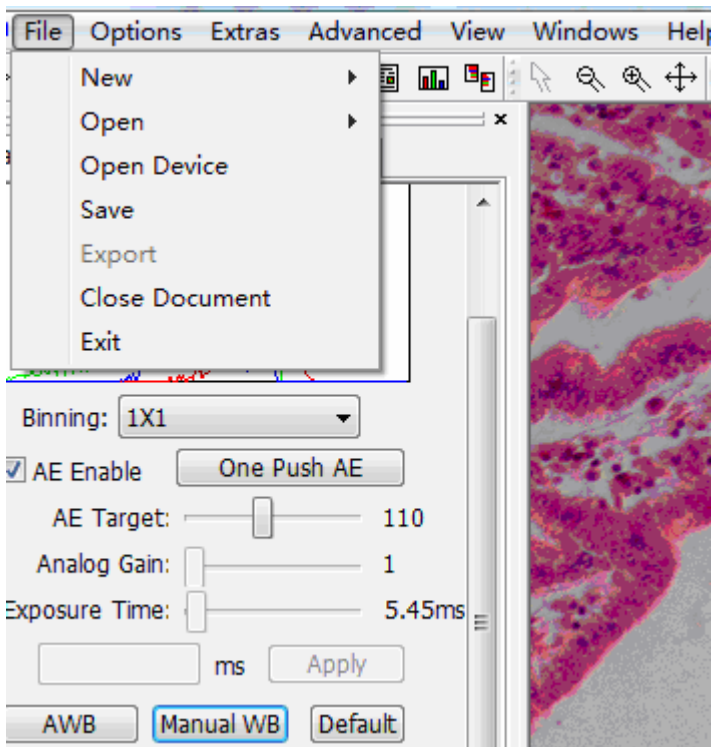

Table 13

Table 14

5. Before observing a sample, you can adjust white balance first to avoid image distortion.

One Key White Balance can intelligently adjust the image background to pure white, and make the tone of image approach the effect watched via eyepiece. When using, firstly the objects on the stage should be moved outside your visual field, making the background of your visual field to be pure. Then click the *One Key White Balance* in the left toolbar, after that, you can move the samples back. (As on the table 15/16)

Regional white balance: remove the specimen off the FOV, then click "Manual WB" button and select a white area in the FOV with mouse
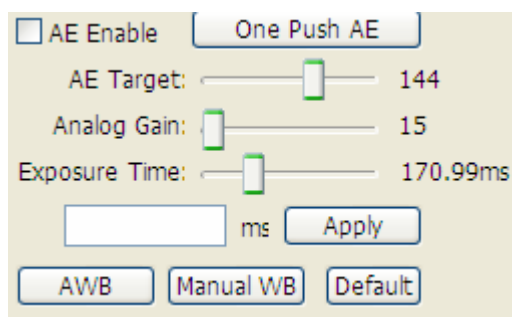

Table 15

Before and After Comparison of White Balance：

Before white balance：   **real-time image**

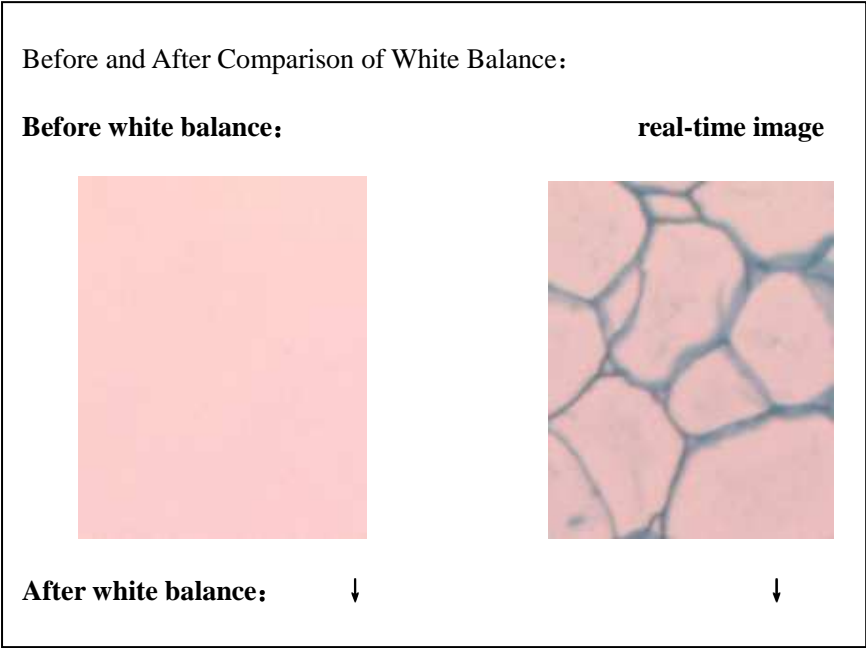**After white balance：**   ↓   ↓
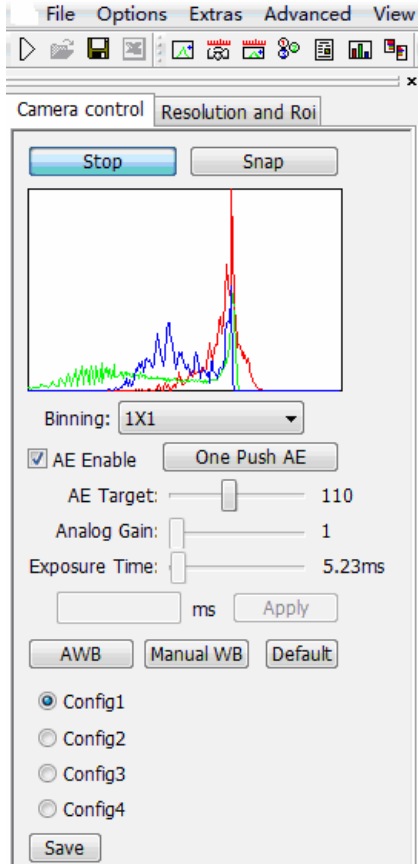
Table 16

6. Extract [Advance Setting] from the left toolbar, or click [View]-[Advance Image Setting], or directly use the Shortcut Key [F7] to adjust the video parameters. Regarding the adjustment of video parameters, please refer to the chapters illustrating image capturing in the Manuel (as on table 17/18)
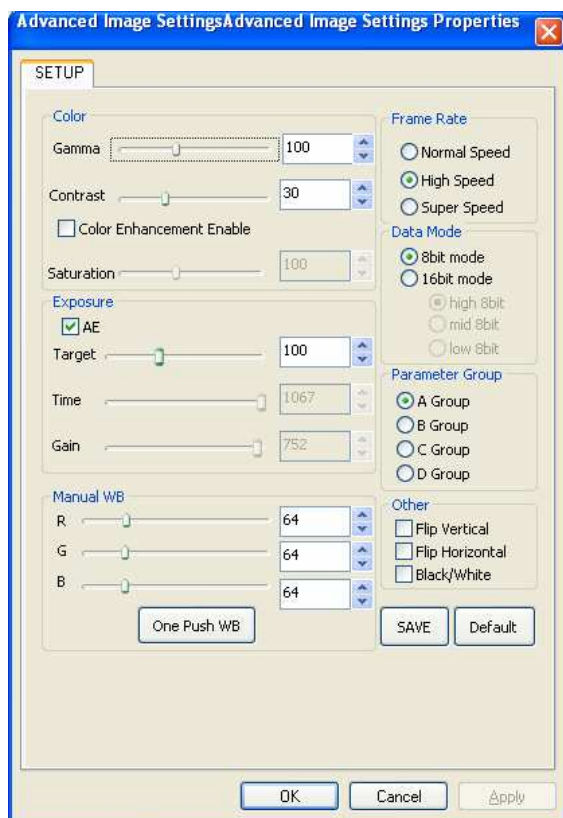

Tabel 17

Table 18

7. Adjust resolution by clicking Resolution Setting in the left toolbar, clicking View-Resolution Setting, or clicking F8. The camera always provides various resolutions for different applications. For example, D300, which offers 3 kinds of resolution including 640*480、1024*768 and 2048*1536, allows you select high resolution when taking static photographs and middle or low resolution when taking videos.(as on table 19)
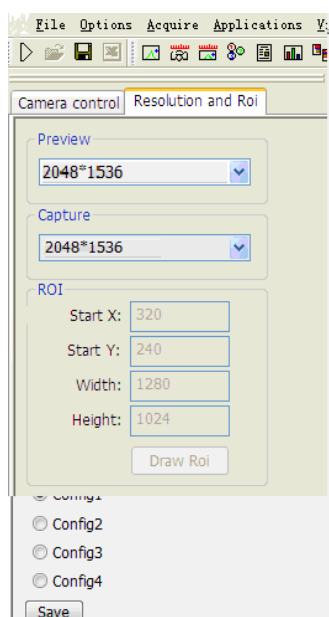

Table 19

8, Click in the toolbar, enter save contents and names of the file, choose save format, and click Confirm to save the present preview image. (as on table 20)
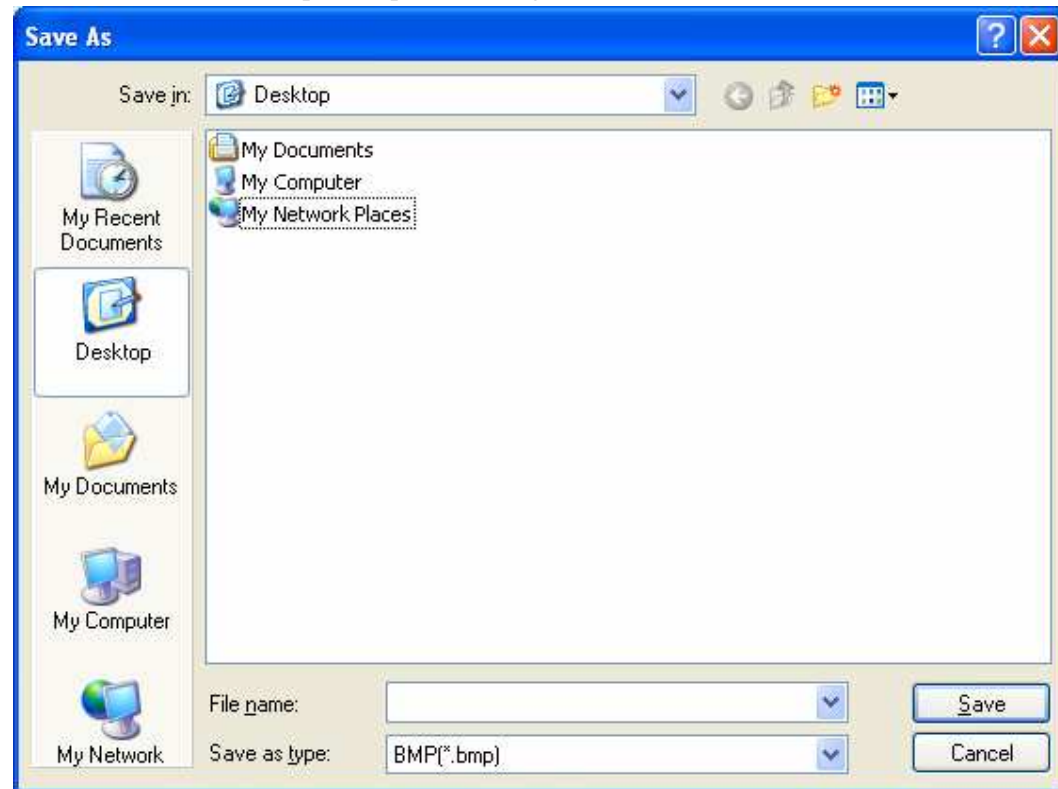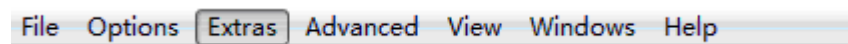

Table 20

Menu bar

When the program was in preview mode, all menu bars are operable. The opening of functional modularity is controlled by hardware password.

File Options [Extras] Advanced View Windows Help

Main Menu	Tear-off Menu	functions	Standard configuration ● /adapted configuration○
File（F）	New	New Dynamic Measurement or Report	●
	Open	Open image and measurement data	
	Open device	Select image receiver	
	Save	Save present preview pictures via select directory, filename and file format	
	Export	Export measurement data	
	Close Document	Close present preview window	
	Exit	Exit program	
Option（O）	Language setting （F5）	Choose program language (Chinese/English)	●
	Calibration	Calibrate picture elements, precision, etc.	
	Display	Display present photo properties and so on	
Acquire	Snap（F2）	Capture pictures to catalogue set by auto photograph	●
	Record Video（F4）	Start video recording function	
	Auto Snap Settings	Adjust relevant parameters of auto capturing	
	Auto image cutting Settings	Start Auto image cutting Settings	

Main Menu	Tear-off Menu	functions	Standard configuration ● /adapted configuration○
	Shade Correction Setting	Start Shadow Correction Setting	
	Start auto Snap	Start auto image capturing function	
	Stop Auto Snap	Close auto image capturing function	
	Enable Auto-focus	unopened	○
	Enable Sensor Temperature Control	unopened	
	Auto-focus settings	unopened	
	Temperature Control Settings	unopened	
Advanced（A）	Image enhance	Start Image Processing	●
	Dynamic Measure	Measure dynamic image data	○
	Static Measure	Measure static image data	●
	Auto Count	Particle count model is started to deal with present preview image	○
	Report	Generate pathological reports	○
	Reflectivity Measure	Test albedo of some material in core sample (this function to be used under the condition of collocating with IF550 filter)	○
	Image Splice	Joint Associated Pictures	
View	WDM settings(F7)	Started when using WDM, applied to video parameter setting	●
	Resolution settings(R)	Preview and capture image resolution	

Main Menu	Tear-off Menu	functions	Standard configuration ● /adapted configuration○
	Zoom	Choose preview size (adaptive size/full size 1:1)	●
	Camera control Panel	Start camera control model	●
	Navigation view	When measuring images, it is used to locate measuring spots	○
	Measurement data table	Start image parameter measurement model	○
	Toolbar	Choose window toolbar type	●
	Status Bar	Show present device and status	●
	Full Screen	Full Screen Preview	●
Window	Cascading	Cascade preview window	●
	Tile	Tile preview window	
	Arrange Icons	Arrange icons	
	Maximize	Maximize preview window	
	Minimize	Minimize preview window	
	Resize	Restore preview window	
Help		Show relevant information of program	●

Image Capture

1. In a preview, click *Photograph* in the left toolbar or choose *Additional Function-Photograph,* or directly click F2 to make static capture to the present preview image. (as on table 21)
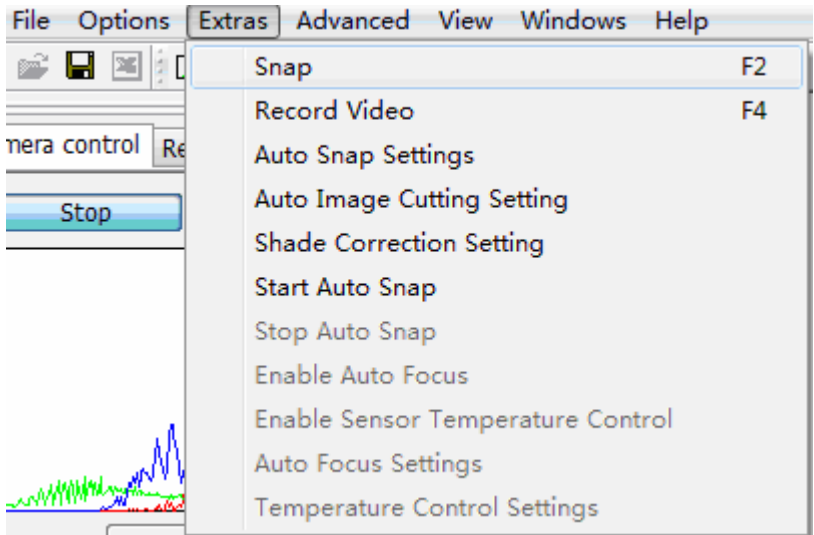
Table 21

2. After clicking *Photograph,* you should specify a directory path for the image. If you capture image in *Additional Function,* the image will be directly saved to installation folder *Image.* (as on table 22)
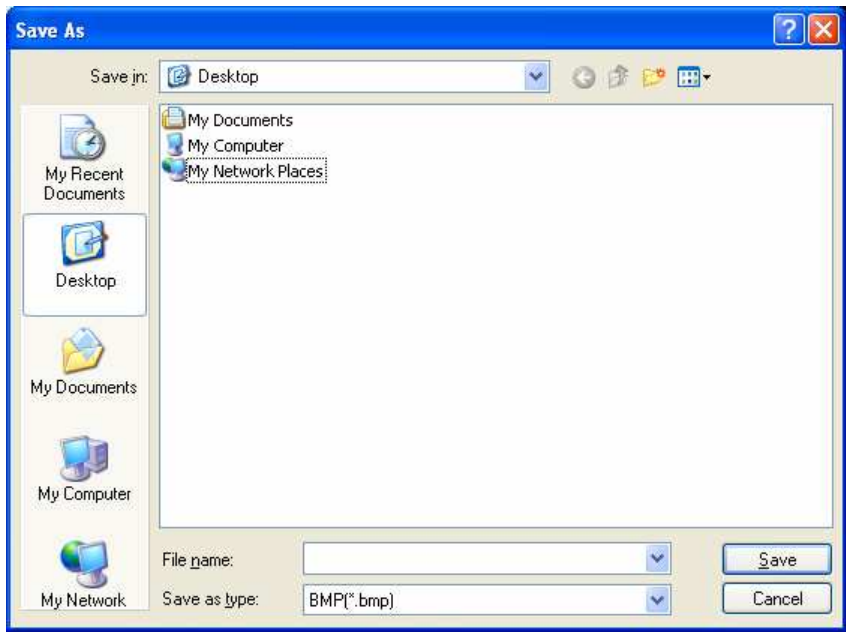
Table 22

Make dynamic capture to the present preview.

Select *Video Recording* in *Additional Function,* or directly click F3. The video parameters could be set before recording. (as on table 23)
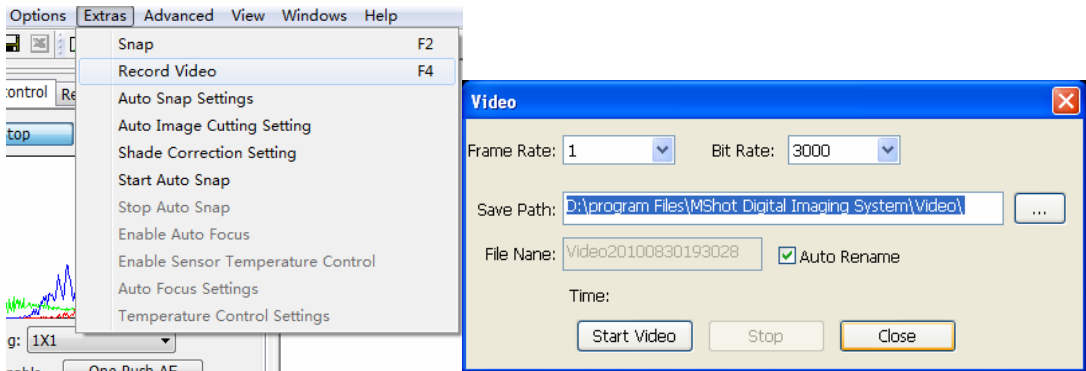
Table 23

Capture image by unceasingly taking photos of present preview. You can set the photograph parameters in *Additional Function-Auto Photograph Setting* (remarks: time interval should be more than 0). After finishing setting the parameters, choose *Open Auto Photograph* to start and *Close Auto Capturing* to close. (as on table 24/25)
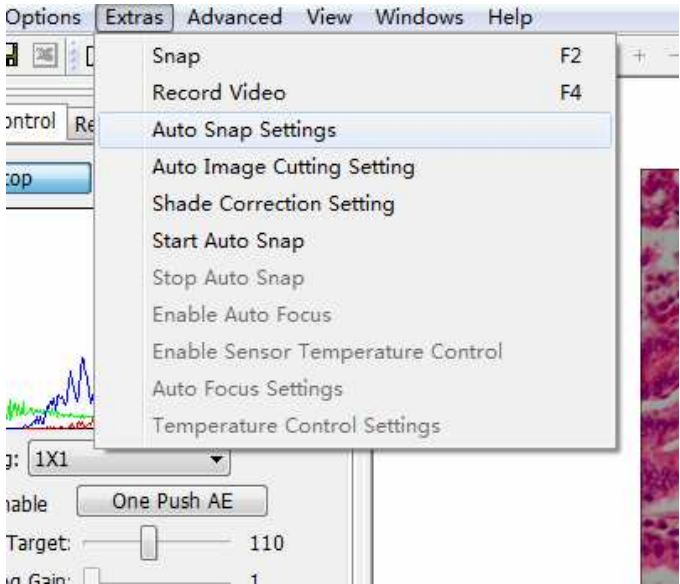
Table 24
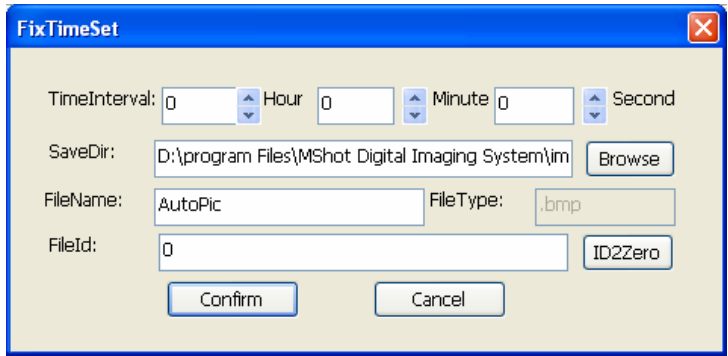
Table 25

Shadow Calibration Setting

Calibrate the shadow in the current preview page. To calibrate in the condition that the central part is brighter than other parts of the image.
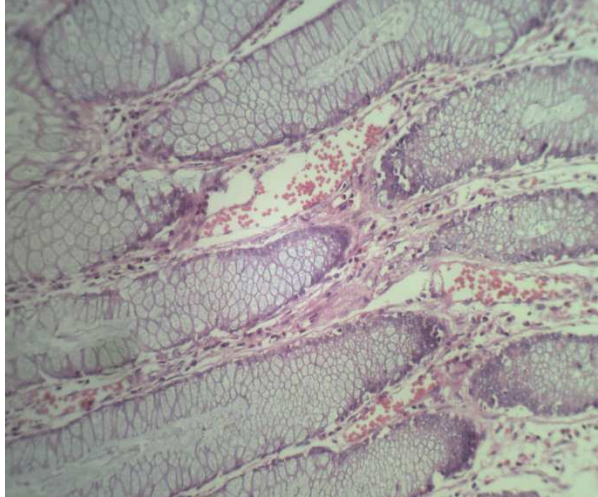
Chart 26

For the over-bright central part, setting of the calibration parameters should be done prior to the calibration.

1. Click [Acquire]-[Shadow Calibration Setting] to enter the page of setting the shadow calibration parameters (Chart 27):
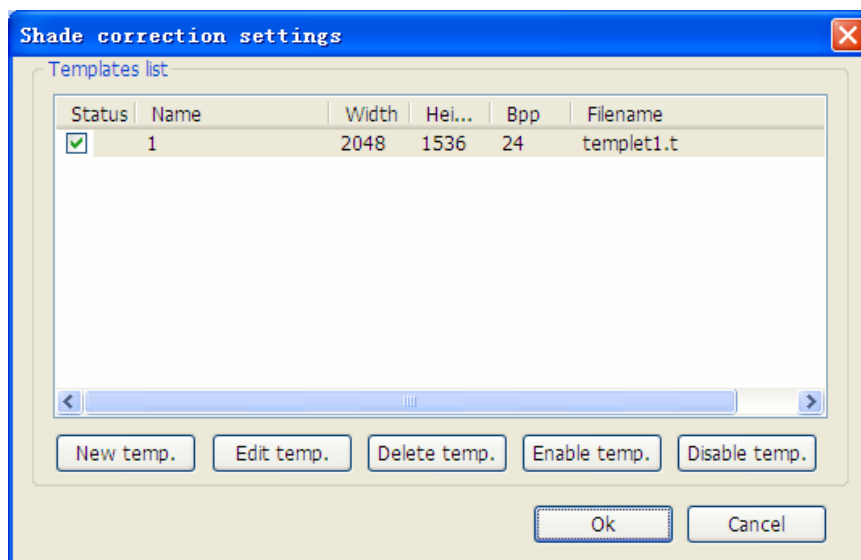
Charter 27

2. Click [New Template] to enter template adding window (Chart 28, 29):
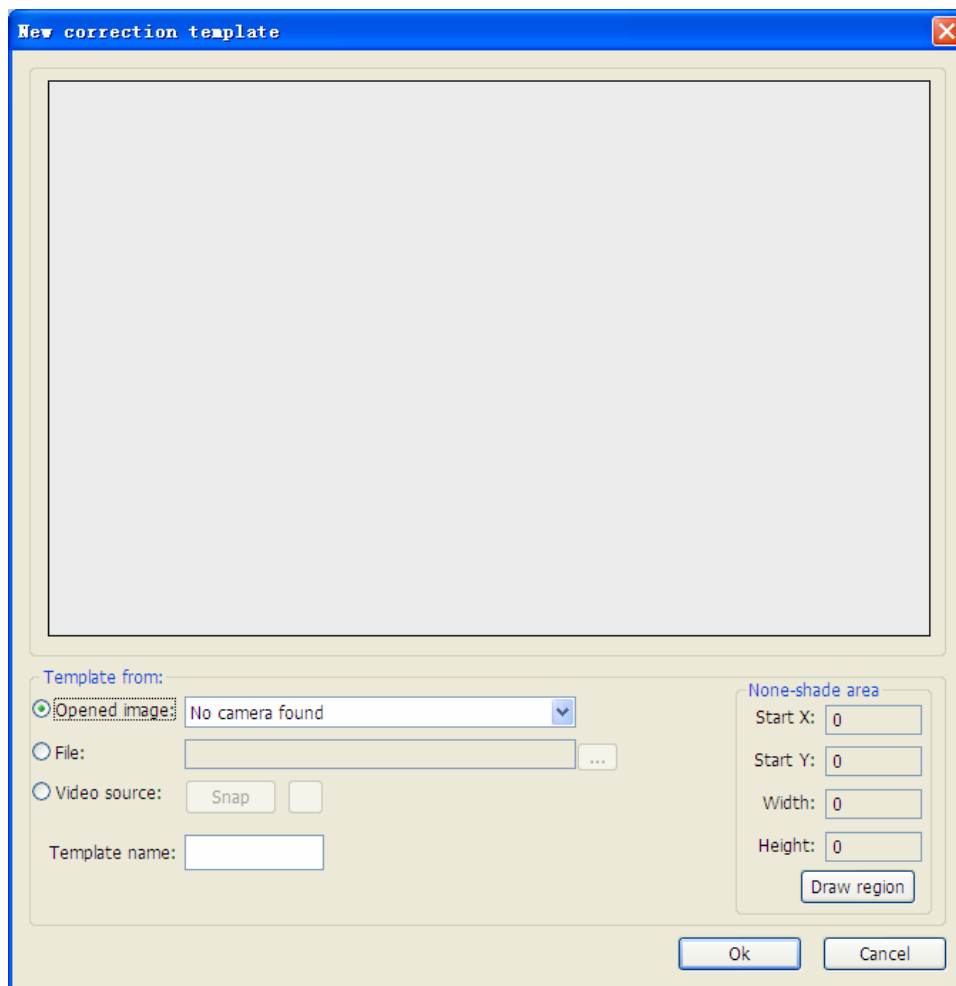
Chart 28
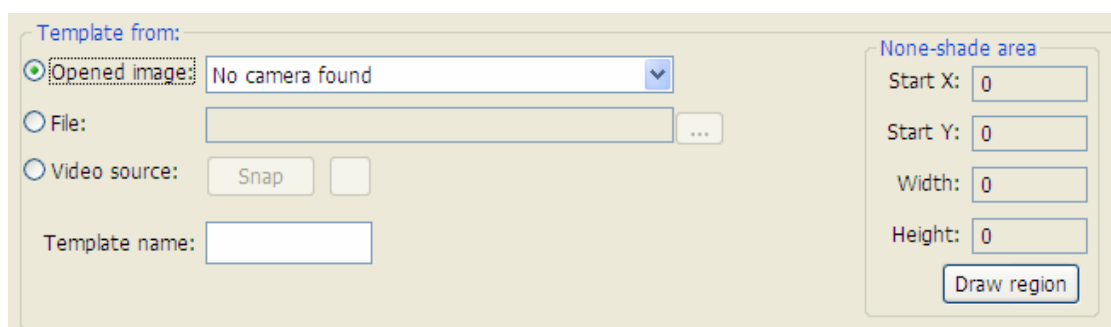
Chart 29

3. Click [Snap] from [Video Source] to enter video source selection, select current video source. (Chart 30)
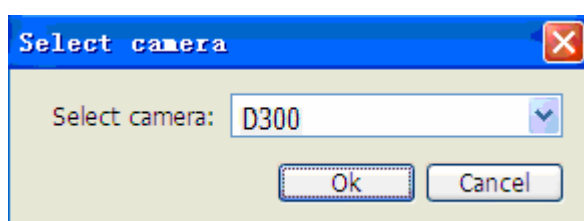
Chart 30

4. After selection, click [Snap] to snapshot the current image, and enter the remarks name in Template Name. (Chart 31)

Notes：Before the image capturing, you should adjust focal distance and move samples away. The template should be pictures of blank sample.
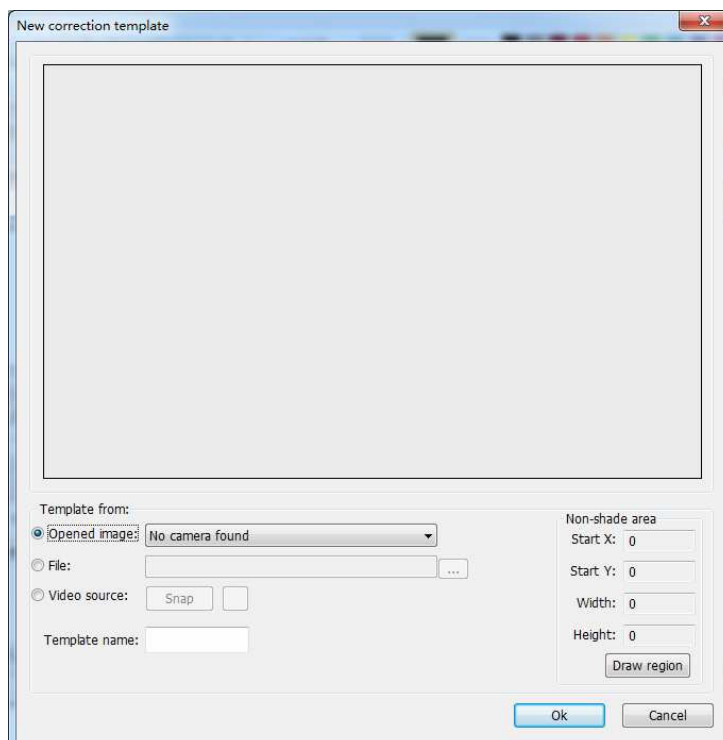
Chart 31

5. Click [Enter] →select region of appropriate brightness→[Confirm], and then template is added successfully. (Chart 32)
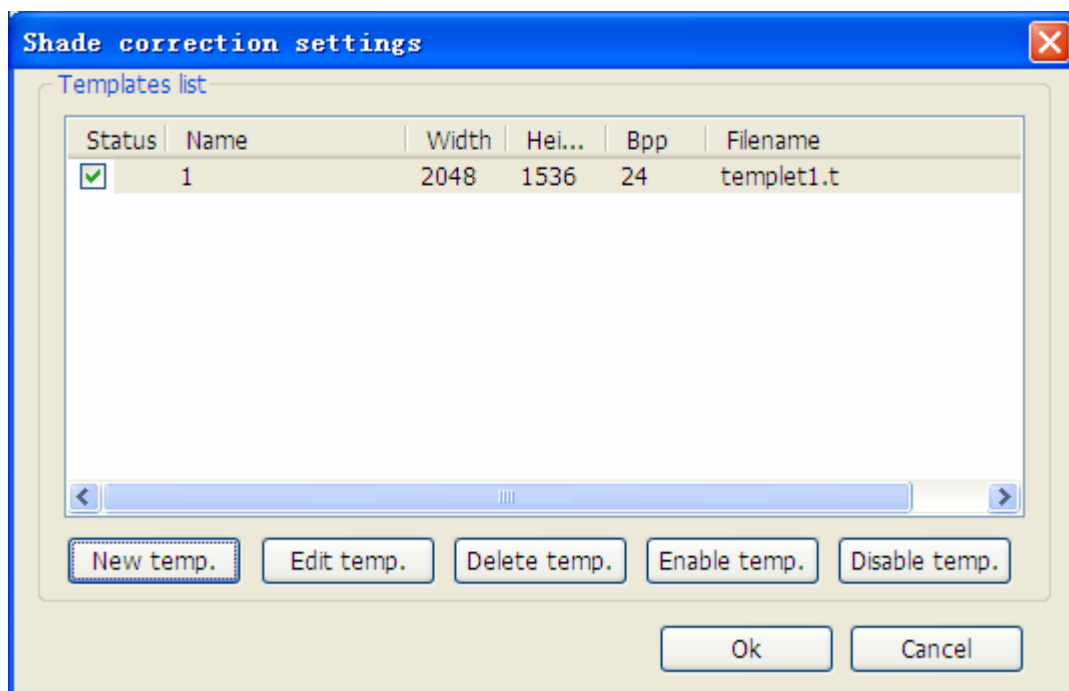
Chart 32

6. Select designed template in checkbox and click [Confirm] to finish parameter setting. After completing the shadow calibration, there is no bright speck in the photos. (Chart 33)
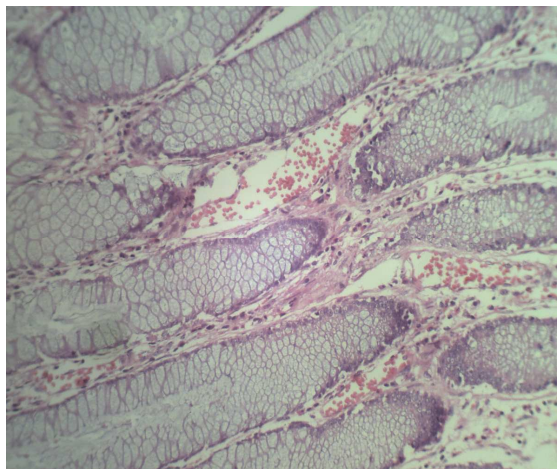
Before calibration   After calibration
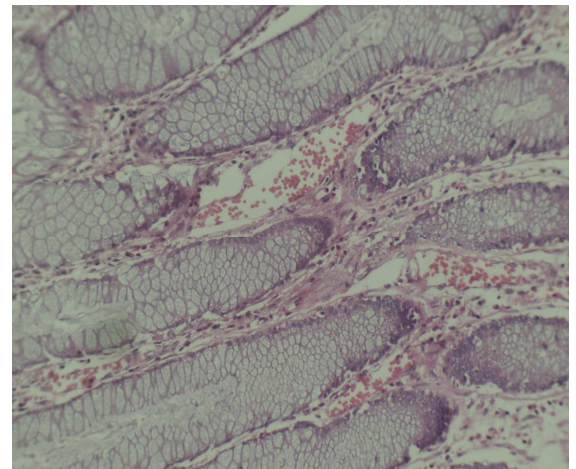
Chart 33

Image Measurement

1   Make dynamic/static measurement on the preview page. Select [Advanced]-[Dynamic/Static measurement]. Above the navigation bar standing on the left of Chart 40 is the position navigation, and the below is the longitude and latitude navigation of the place where mouse points. (as on table 34, 35)
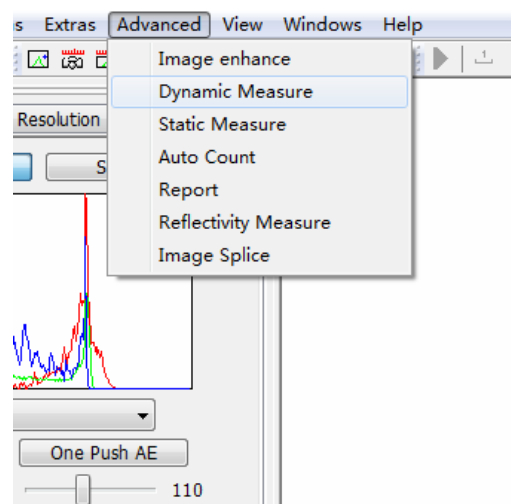
Table 34
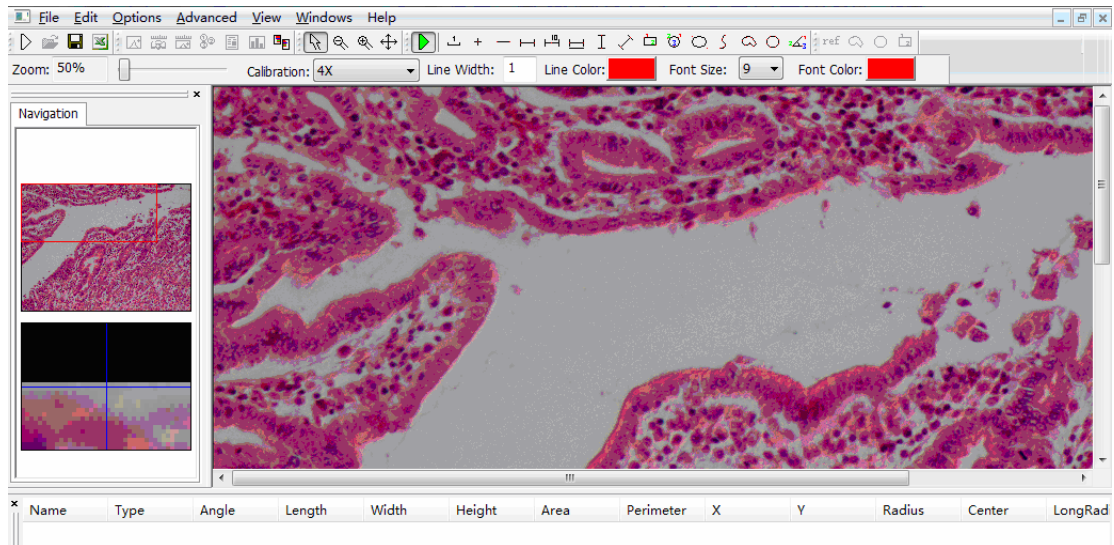
Table 35

2 . Measure Add Area

Measuring tool in toolbar can be used to measure the objective. Choose *Option-Calibration* to measure magnification. Introduce the tools in toolbar as follows. When deleting the measurement tools placed, you can pick the objectives and Editor-Delete. When adjusting measuring tools, firstly you can click the tool picked and then plot a region in the picture to be measured.

[Insert Rulers] standard proportional scale

[Insert Gauge Point] locate x, y coordinate of target point

[Insert Line Segment] measure the distance between two target points

[insert rectangle] left click to mark the diagonal points of the rectangle and measure the length, width, size and perimeter.

[insert circle] left click to mark 3 points on the circumference and measure radius, perimeter and size.

[insert ellipse] left click to mark the diagonal points of enclosing rectangle and measure the long diameter, short diameter, perimeter and size.

[insert curve] press and hold down the left key to mark the key points of the curve and measure the length.

[insert hand-sketched region] press and hold down the left key to mark the key points on

the circumference and measure the perimeter and size.

○ [insert polygon] left click to orderly mark the corners of polygon and measure the perimeter and size.

∠ [Insert Angle] mark angle

↖ [Select] select tools has been used to measure

3. Calibrate Survey scale

After clicking ⊥ , the setting window popup (as on table 36). When setting parameters, you can choose unit: px、cm、mm、um. When filling name allocation, name modification could choose *Option-Calibration* in the menu, and modify the allocation name (as on table 37)
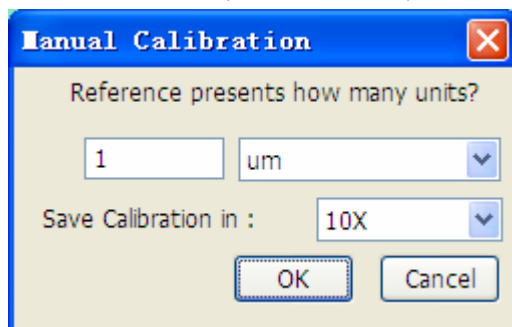
Table 36
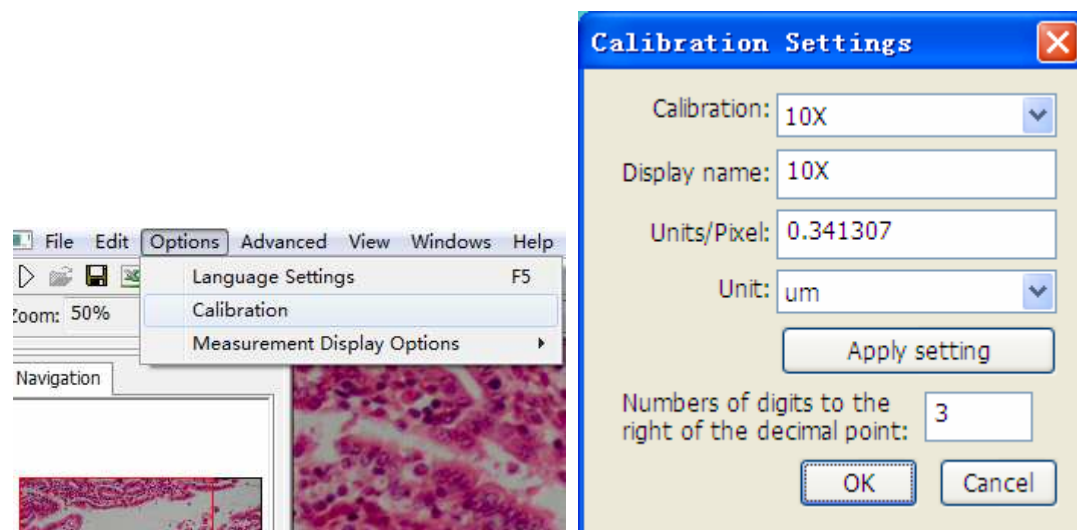
Table 37

4. Save data

Choose *File-Save Pictures* , and then the pictures including measurement data can be obtained.

Choose *File-Save Data,* and then the excel file including measurement data can be obtained.

Albedo Measurement

1. Save data

After starting MShot Digital Imaging System, open the image input device (please refer to Start MShot Digital Imaging System).

In Application menu, choose albedo Measurement to deal with the present preview image, or Start albedo Measurement , start albedo measurement model, make use of the submenu Open in the model, and enter the image file to be handled. Take the below demo. jpg for example. (As on table 38)
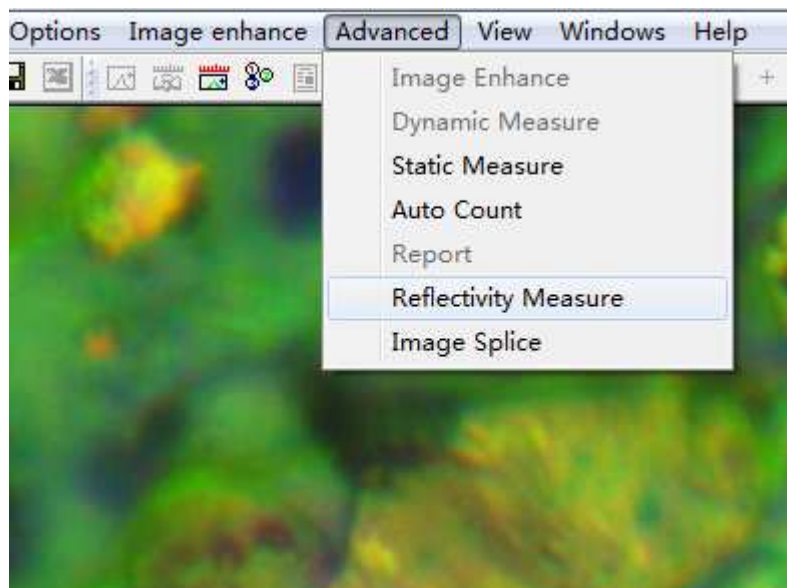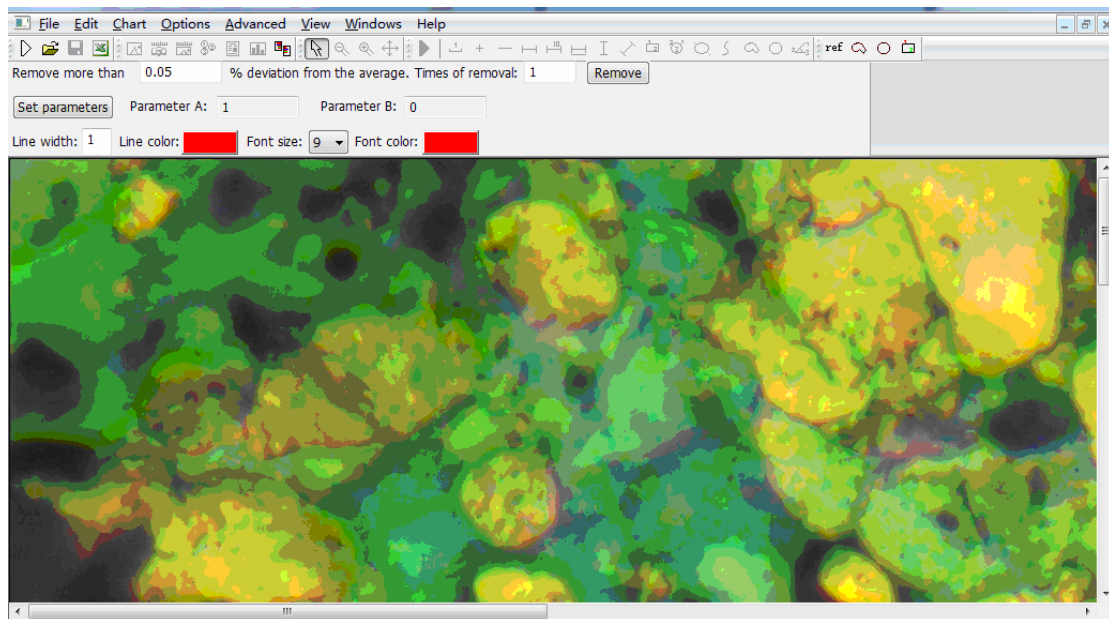
Table 38

2. Standardization

Click menu bar `ref` or choose *Editor-Add Area-Reference,* choose the NO. of reference point saved and standard albedo ratio, click *Confirm.* Click the upper-left corner and bottom-right corner of the region in the picture to select standard area. Operate repetitively to make standard points as many as possible. The software will standardize the regression curve and give relevant parameters according to the average gray-scale value of this region.

Albedo ration □ coefficient A□ grayscale □ coefficient B

3. Modify Standardization
Click setting to modify the standard points marked. (As on table 39)

Table 39

4. Measurement

Add measurement area. You can make use of toolbar to select irregular region, polygon and rectangle.

5. Preview table. Choose *Operation-Preview* Table to preview inputted data and table. (As on table 40)

Table is a histogram, indicating mark off statistics area according to the size of grouped region appointed and calculates the proportion of sample number per region to the total amount. Right click the histogram to delete cylindricality.

Note: when previewing a table, please appoint a region at first. The corresponding rectangles will be deleted at the same time when deleting the cylindricality.
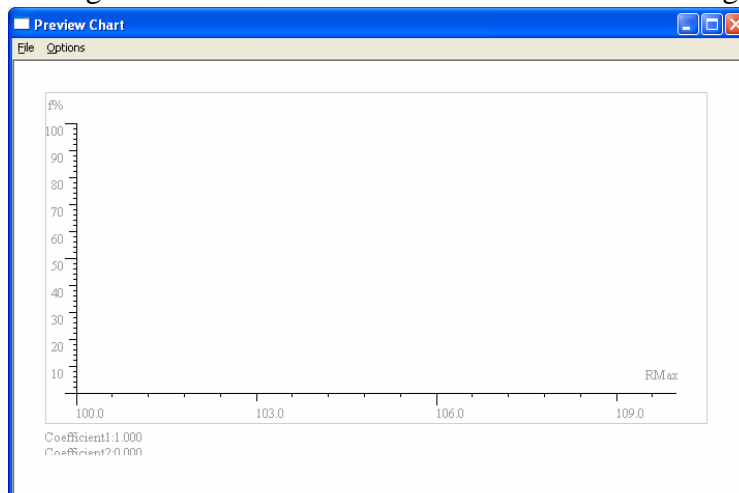

Table 40

6. Modify parameters. Preview relevant parameters of the table, including True Type, color, grouped region, etc. all of which can be modified in *Option-Setting*. (As on table 41)

Table 41

7. Output data.
Choose File-Export Data to get excel reports that consist of data and table. (Table 42)

Table 42

Auto Count

1. Number the particles of preview image. *Choose Application-*Auto number, (as on table 43)
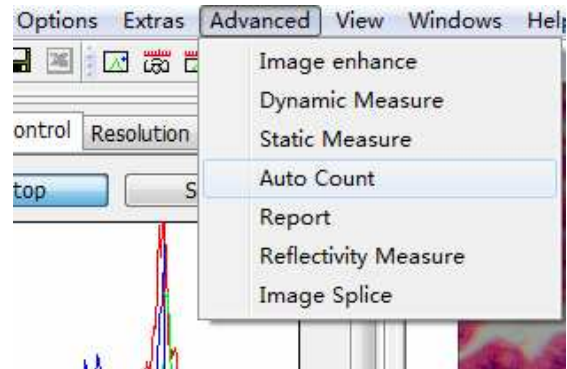

Table 43

2. Menu bar will change as shown below. Click *Counting Function*, and choose *Start Counting.* (as on table 44)
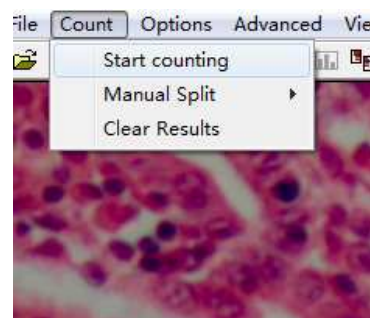

Table 44

3. Appoint counting parameters, and then click Counting. The result will show on the dialogue box directly. The size of counting points and their coordinates will also appear in the preview. (as on table 45)

Remarks:

(1) the bigger the histogram threshold is, the more the white pixels transformed will appear in the image.

(2) Software will only count the white object, and will select *Opposition* when the object displayed is black.

(3) The greater the minimum area value per object entered is, the bigger the point area that to be counted will be.

(4) The size of the region is to be counted according to the pixel, entering 20-50 means screening a region ranging from 20 pixels to 50 pixels, but simply omitting the other regions, and export the amount of the regions in the end.
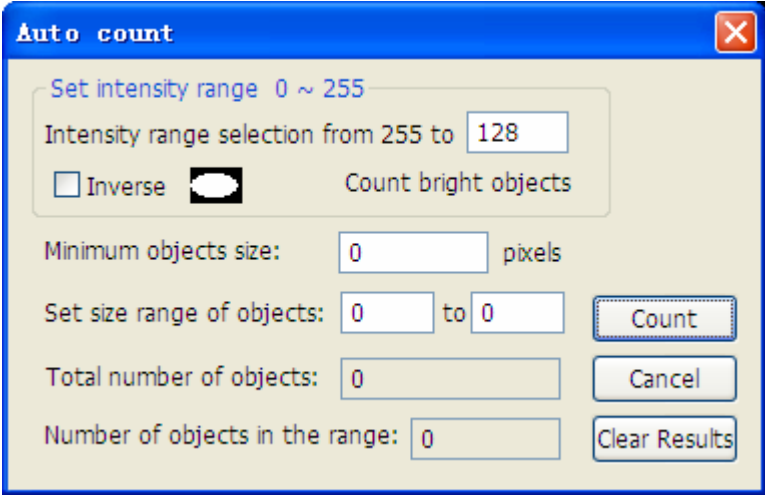

Table 45

Image Processing Functions

1. Handle the present pictures by opening a picture in *File* or clicking

2. Choose *Image-Image Processing/Image Enhancement,* and then handle or select the image according to the demand. (as on table 46)
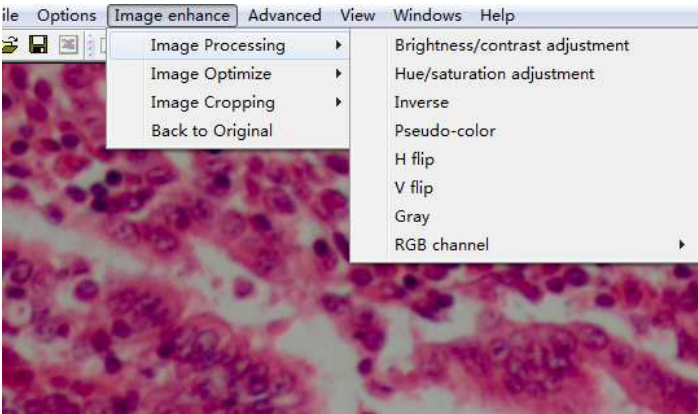

Table 46

When choosing *Brightness/Contrast Adjustment*, a dialogue box popup (as on table 47). The bigger the brightness value is, the brighter the image will be; the greater the contrast value is, the higher contrast of color will be.
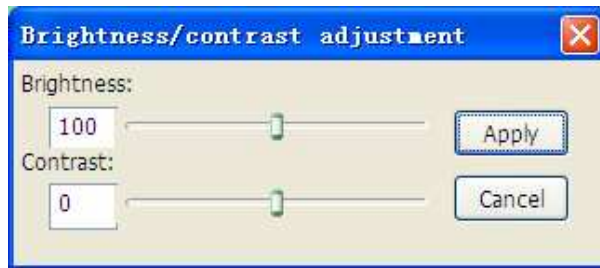
Table 47

When choosing Tone/Saturation Contrast, a dialogue box popup (as on table 48). The bigger the tone value is, the more bright-colored the image will be; the greater the saturation value is, the deeper the color of the image will be.
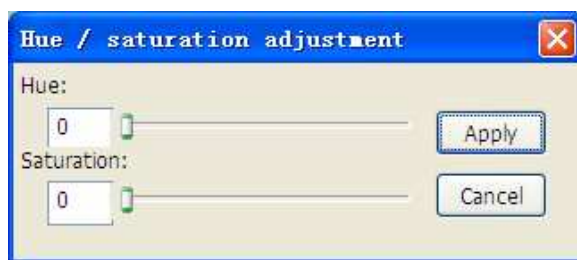

Table 48

3. After save the image processing by clicking , you can click Return to *Original Picture* to rehandle the image. (as on table 49)
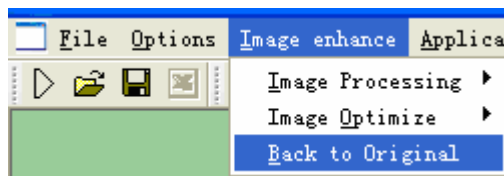

Table 49

Report Function

Pathology Report

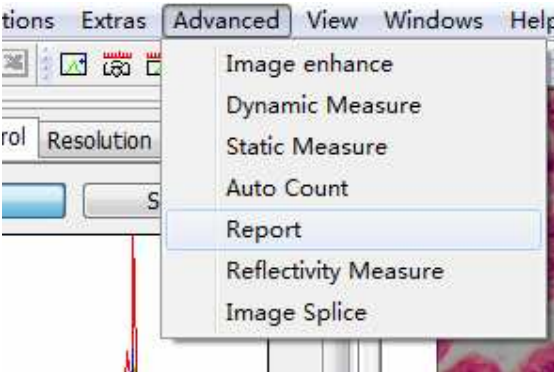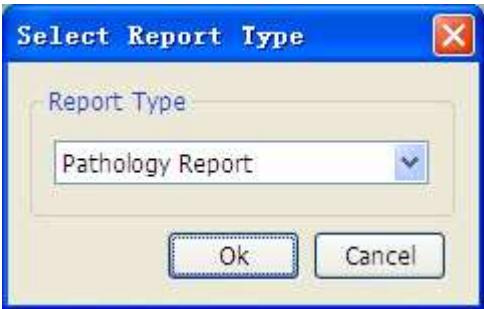1. Generate reports from the preview, and set up files. Choose Applications-Reports. (as on table 50)

Table 50

2. Enter information about the preview image. The following picture is the example of maternal and child health clinic. (as on table 51)
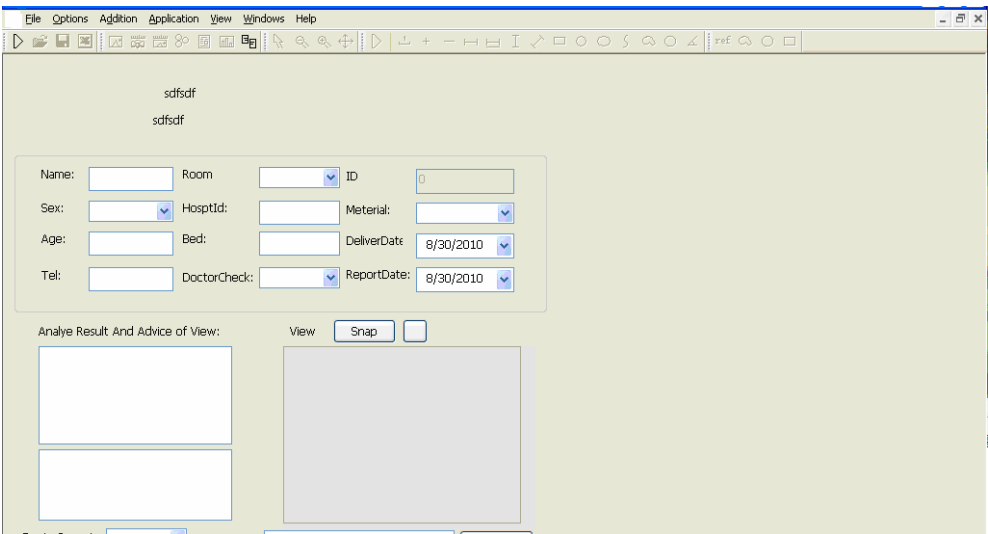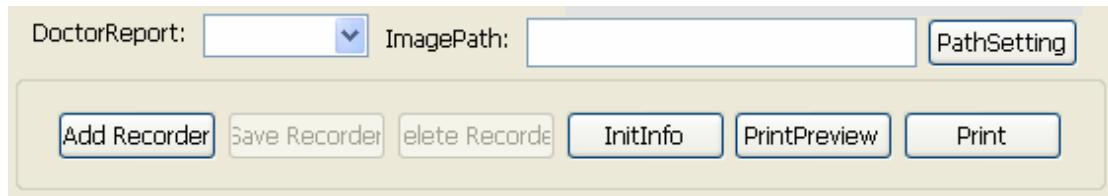

Table 51

3. Add or save recordings. After setting the picture path, click *Add Recording* or *Save Recording* directly. You can also print the reports. (as on table 52)
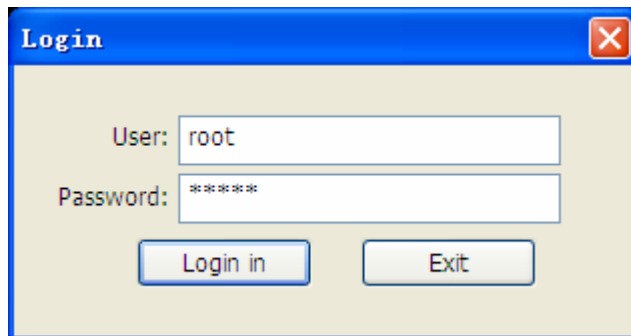

Table 52

4. After saving the recordings, you can click *Information of All Zeros* directly to add new records, and then return to the first operation.
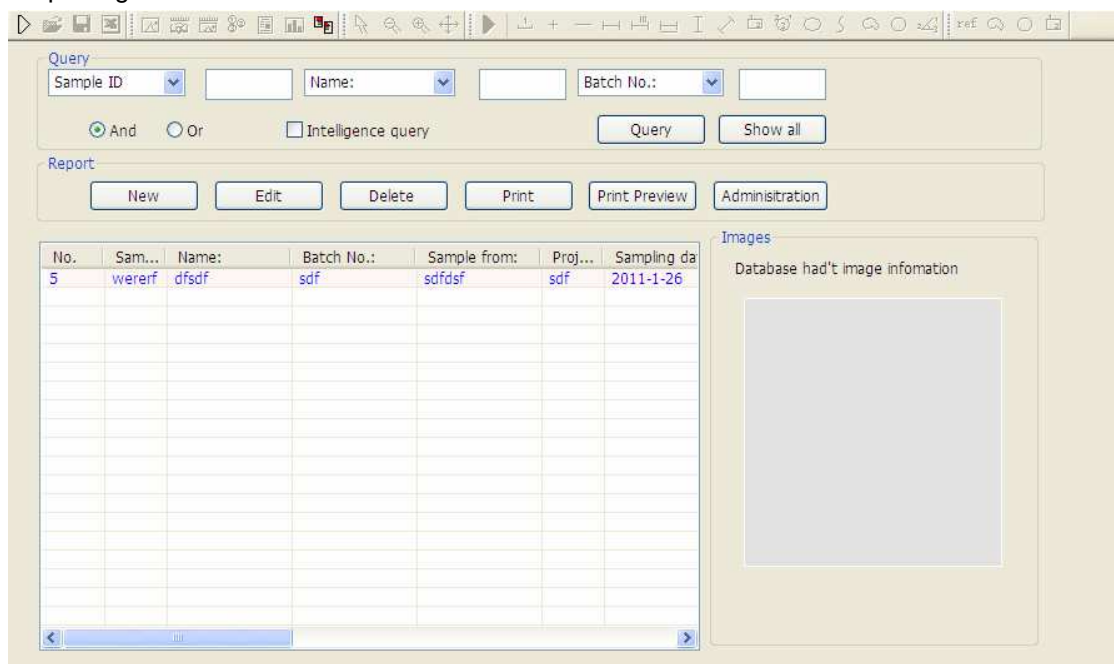
Detection Report

Basic reporting operation

1.   Select Detection report function.
2.   Enter user name & password in the dialog box and click [Confirm]. Notes: initial user name is root, password is 12345.

1.   Reporting function can be realized. Interface is as follows:

2.   Click [New Report], add report data.

3. Enter parameters of the sample added, click [Snap] to capture sample image.
4. Click [Add Data] to record data of sample.
5. After finishing adding dada, click [Finish]. If you want to add a new recording, back to the step 1.
6. If you want to check data, click [Edit] from data list, or double click [View Details].
7. If you want to edit or delete data, click [Edit Report] or [Delete Report] in the selected report.

Query Operation

1. In the Query Operation Workgroup, make a query on report by entering single or more query conditions.
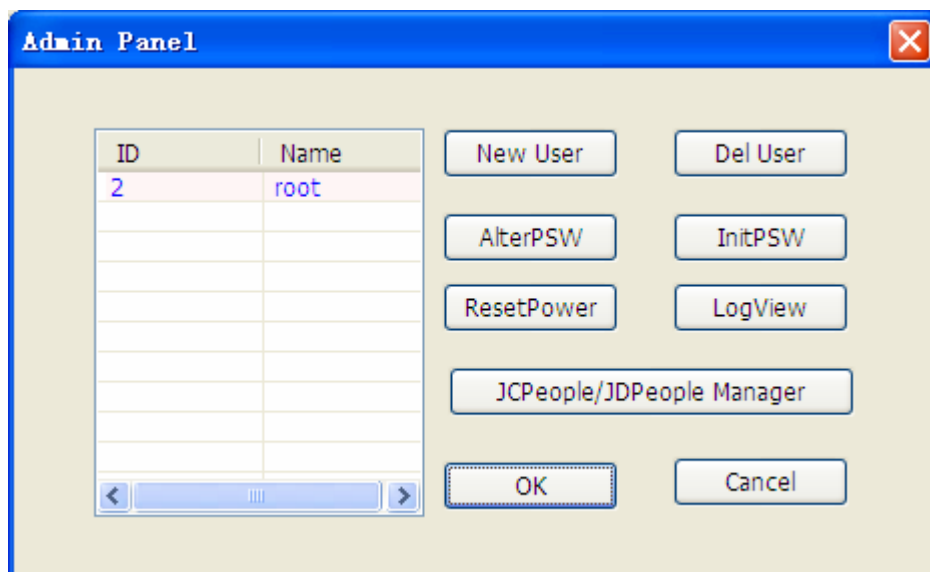
2. After confirm the query conditions, click [Query]
3. After querying, only matched report data shown in the report recording list. Click [Full Display], and then all report data will be displayed.

Administrator Operation (administrator only)
1. Click [Admin] to enter administration control panel.
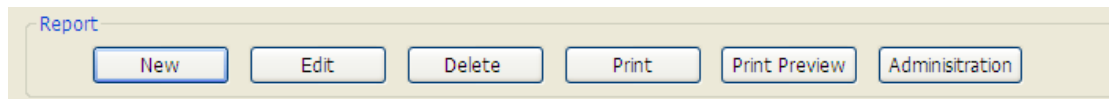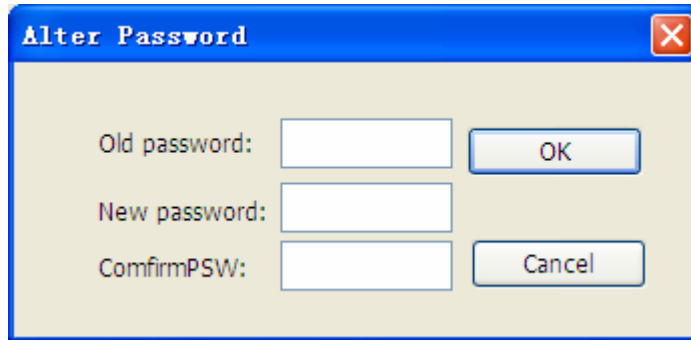
2. Administrator can manage report users.

1. [Add Users]: could manage users and set permission.
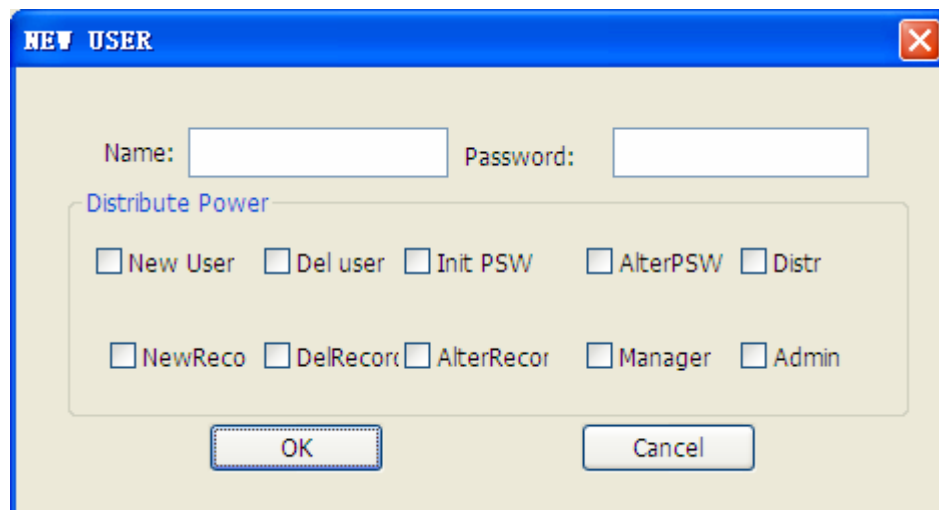
2. [Delete Users]: could delete current users.
3. [Modify User Password]: modify the password of the selected users.
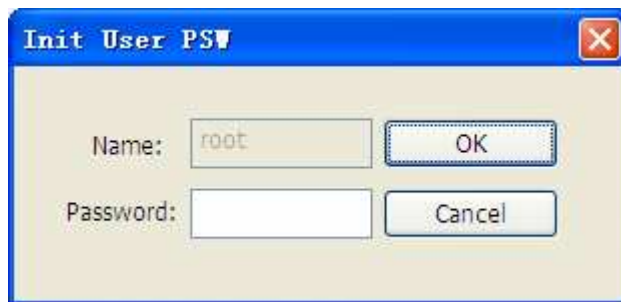
4. [Reset User Password]: reset the password of selected users.
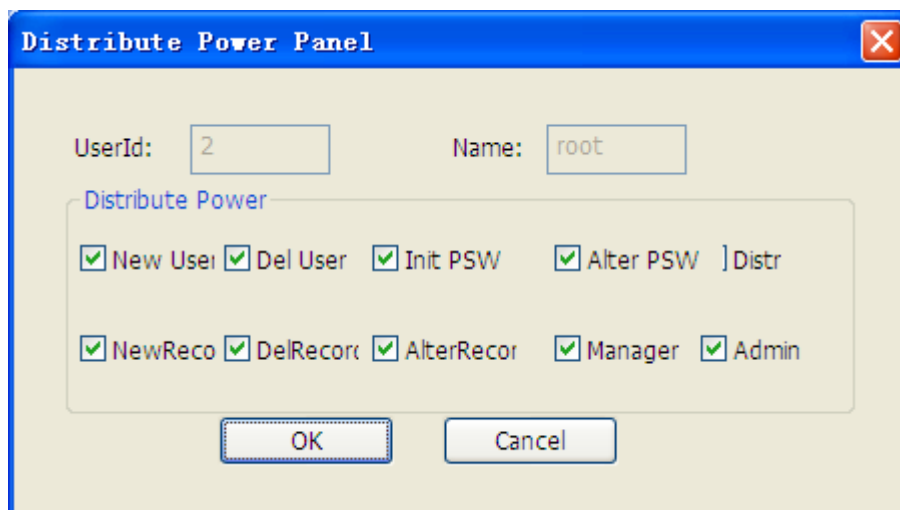
5. [Modify User Permission]: modify the permission of users

6. [View Log]: view operation recording of users.
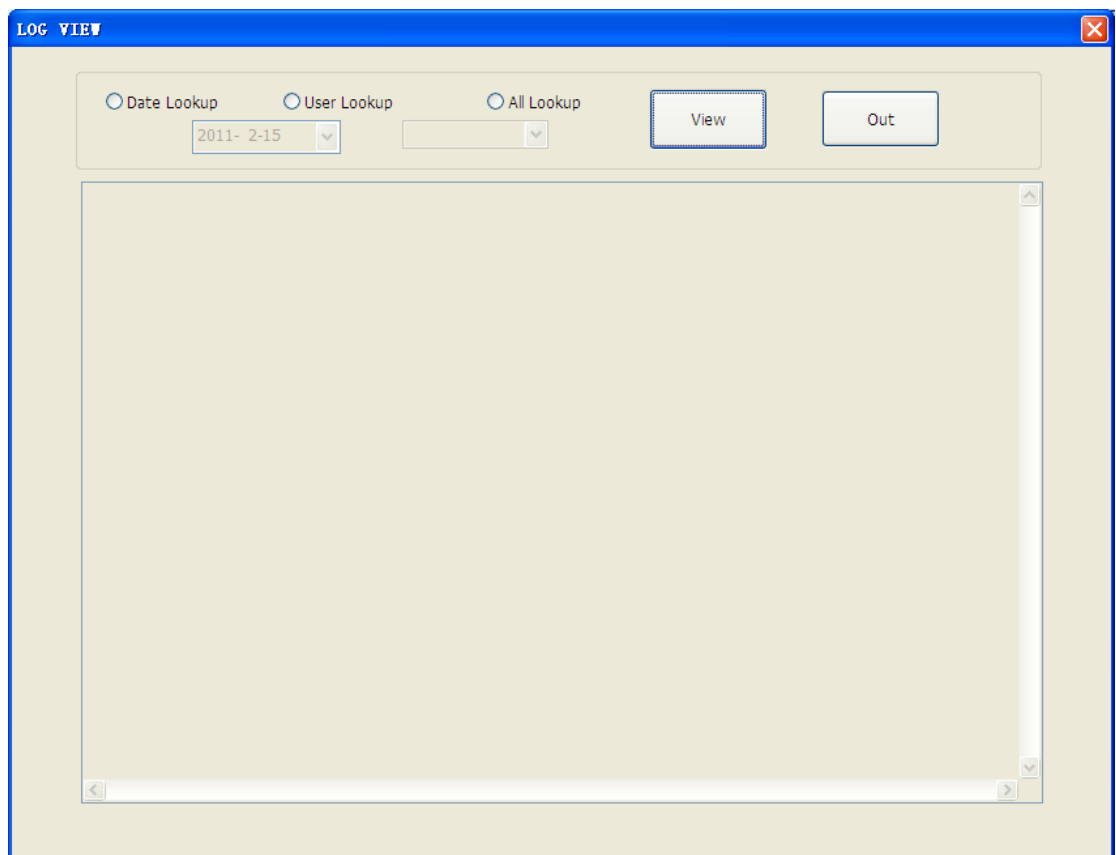
7.   [Inspector/Surveyor Management]:
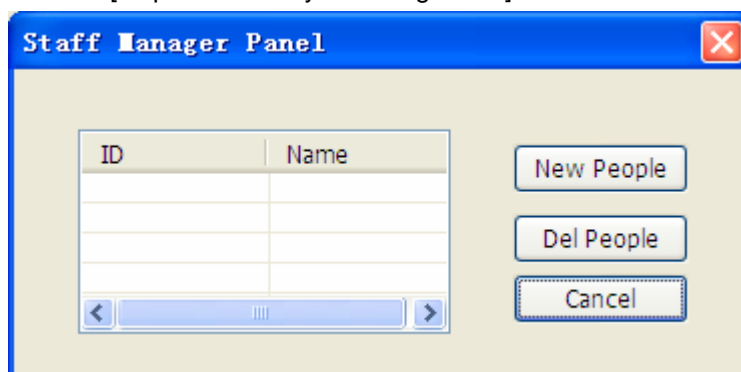
8.   [Confirm]: confirm management operation, and exit.

9.   [Delete]: delete management operation, and exit.

Solution of FAQ

Question No.	Phenomenon	Solutions
1	setup.bat can't be started under Vista\Windows 7，user check fail。	Start by using administrator account, or start command mode by using administrator account, carry out setup.bat
3	No devices on the device listing	Please close image processing software, install camera driver first. In case of installation of driver, please solve problems in 4 methods according to the questions.
4	Fail after selecting video devices, RasMan initialization failure.	（1）make sure camera has been connected to USB2.0 port. （2）pull out the USB2.0 port, re-connect and re-start. If fail again, please change to the other USB port (the USB port behind the host computer is recommended in case of desktop)

Question No.	Phenomenon	Solutions
5	After opening the capturing window, the image window is in darkness.	（1）if the microscope is a kind of rod beam-splitting microscope, please pull the rob to the digital imaging equipment. （2）please adjust adjustment knob of micro lamb to raise the brightness of lamb. （3）please solve problems in 4 methods according to the questions.
6	After opening the capturing window, the image window is brilliant white.	（1）the illuminator is over bright, please lower the brightness of the lamp. （2）open 2 video capturing at the same time, after closing capturing software, open one of them. （3）insert camera into USB1.1 port, exchange computer.
7	The tone and color of preview picture in image window is largely different from that observed via eyepieces.	Please adjust white balance, refer to the part about image capturing in manual.

Question No.	Phenomenon	Solutions
8	The visual field of preview image in image window is much smaller than that observed in the eyepieces.	Because of the smaller size of sensor, this phenomenon is usual. In case of needing bigger visual field, please contact us for selecting 0.5X port, 0.63X PORT.
9	Image blurring	（1）the aperture is too big, please close it properly. （2）when the eyepieces and camera are out of step, clarities don't occur at the same time, please adjust the synchrony of C port.
10	Collocated with stereo microscope, jerky video appears.	The exposure period is too short, please change into manual exposure and lower the grain to add exposure time.