

INFRARED THERMAL IMAGING USB2.0 CAMERA

ARTCAM-320-THERMO Ver.1200

Instruction Manual

ARTRAY

ARTRAY CO., LTD.

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■ Introduction

USB2.0 far infrared thermal imaging camera "ARTCAM-320-THERMO" is made by an infrared detected sensor and image processing circuits. It captures subject's infrared ray (8~14 μm) to get high-quality thermal image.

■ Attention of a manual

Before using this product, please read through this instruction manual carefully in order to use this product correctly and safely.

After reading, keep this instruction manual handy so that you can refer to, whenever you need it.

1. We will exchange the instruction if pages are missing or you lost it.
2. We will not guarantee the product's safety if you do not follow the instruction.
3. The contents of the manual is subject to change because of product's improvement.
4. Actual window and images in the instruction might be different. An image in this manual is simplified.
5. Please contact us if you find any doubt in the instruction.
6. We prohibit reprinting, duplicating and alternating some or all parts of the instruction without our permission.
7. We are not responsible for lost or damage on your pprofit in order to use our products.
8. Our overseas branch do not offer any maintenance or repair.

■ About Symbols

Incorrect operation of the product, inadequate servicing or abuse may result in danger that can cause serious accidents. We point out these possible risks by the following highlights in the texts.

Warning

This symbol denotes a possible danger of death or physical injury if you fail to follow the instructions or if you fail to take the necessary precautions.

Caution

This symbol denotes a possible physical injury if you fail to follow the instructions or if you fail to take the necessary precautions.

■ For Safety Use

Warning

- Stop operating immediately when any abnormality or defect occurs.
If abnormal conditions are present, such as smoke, a burning smell, ingress of water or foreign matter or if the equipment is dropped or malfunctions, fire or electric shock may result.
- Do not use the equipment in locations subject to water splashes.
Otherwise, fire or electric shock may result.
- Do not disassemble, repair, or modify the equipment.
Otherwise, fire or electric shock may result. For internal repair, inspection, or cleaning, contact your sales representative.
- Do not install the equipment in an unstable or inclined location or locations subject to vibration or impact. Otherwise, the equipment may topple over and cause personal injury.

Caution

- Do not install the equipment in locations subject to high moisture, oil fumes, steam, or dust. Otherwise fire or electric shock may result.
- Do not install the product in locations exposed to direct sunlight or humidity.
- Do not expose its camera head to any intensive light (such as direct sunlight) Otherwise, its inner image pickup device might get damage.
- Do not drop the equipment or allow it to be subject to strong impact or vibration, as such action may cause malfunctions. Further, do not damage the connection cable, since this may cause wire breakage.
- Avoid giving a strong shock against the camera body.
It might cause a breakdown or damage. If your camera is used in a system where its camera connector is subjected to strong repetitive shocks, its camera connector is possible to break down. If you intend to use your camera in such a situation, if possible, bundle and fix a camera cable in the place near the camera, and do not transmit a shock to the camera connector.
- When you clean up the product, turn off power to the equipment and wipe it with a dry cloth. If it becomes severely contaminated, gently wipe the affected areas with a soft cloth dampened with diluted neutral detergent.
- If the equipment is not to be used for a long duration, turn off power to the camera for safety. And attach the lens cap to the camera to protect the image pick up surface.
- Do not be handled roughly, damaged, fabricated, bent forcefully, pulled, twisted, bundled, placed under heavy objects or heated connection cable.
- A hot exhausted system can cause serious burns.
Do not touch the product long time.

■ Other Cautions

The place not to leave

- If you leave the product to these places, the product would be damaged:
 - Locations exposed to direct sunlight or humidity.
 - In a narrow location where heat is likely to accumulate.
 - Near a heater.
 - Locations subject to vibration.
 - Near strong magnetism.
 - Dusty area
Leave the product from dust. Otherwise it would cause trouble on the product.
Moreover, the product might be not repairable.

Specifications

- Do not use the product at where has strong electric wave or radiation.
- Avoid intense such as spot light on part of the screen because it may cause blooming or smears.

Maintenance

- The product maintenance.
Wipe it with a dry cloth. If it becomes severely contaminated, gently wipe the affected areas with a soft cloth dampened with diluted neutral detergent. Never use alcohol, benzene, thinner, or other chemicals because such chemicals may damage or discolor the paint and indications. If the image pick up surface becomes dusty contaminated, or scratched, consult your sales representative.

■ Jamming

- It is potential reason for jamming a radio or TV if you use the product near those products.
- Do not use the product in an air plane or a hospital.
It would affect on air plane control system or medical equipment.

■ Exportation

ARTCAM-320-THERMO is categorized as a strategic material under the rule of Japanese Export Control at an attached list page1 10(2) and page10(4).

We need to report to the Ministry of Economy, Trade and Industry to receive the permission to export the Thermal camera whenever we export it to overseas.

Please keep all end user's usage information. And show us whenever we request.

■ Guarantee

We do not issue a guarantee document.

We manage the guarantee term by delivered data and user registration day.

More detail, see the PDF file from the site below.

About the product guarantee policy: http://www.artray.co.jp/download/other/n_hosyou.pdf

Regulation of our products: <http://www.artray.co.jp/download/other/hosyou.pdf>

- We do not guarantee the product's and manual's quality and function for your conformation and marketability in use.
Even though if you get damage directly or indirectly because of it, we do not owe the responsibility for it.
- Do not use for high reliability facilities or machines, such as a medical, a nuclear, an air craft, a transportation or something related on human life. The product is not made for those usages.
We are not responsible for anything even though accident or damage occurred because of the product's trouble in use of those facilities or machines.

■ Waste

- When you decide to dispose the product, please return it to us. Or follow the related law and dispose as industrial waste properly. Do not allow a 3rd party to re-use the product.
Also, please leave the disposal record.



Caution

- Please use the attached adapter or 12V,1000mA adapter.

1. Specifications

1-1 Item List

①ARTCAM-320-THERMO (See 1. 3)	1
②Instruction manual(This booklet)	1
③Device driver software, Viewer software CD	1
④I.T.E Ppower Suplly DC 12V,1A Adapter	1
⑤Infrared Thermometer	1

1-2 Specification

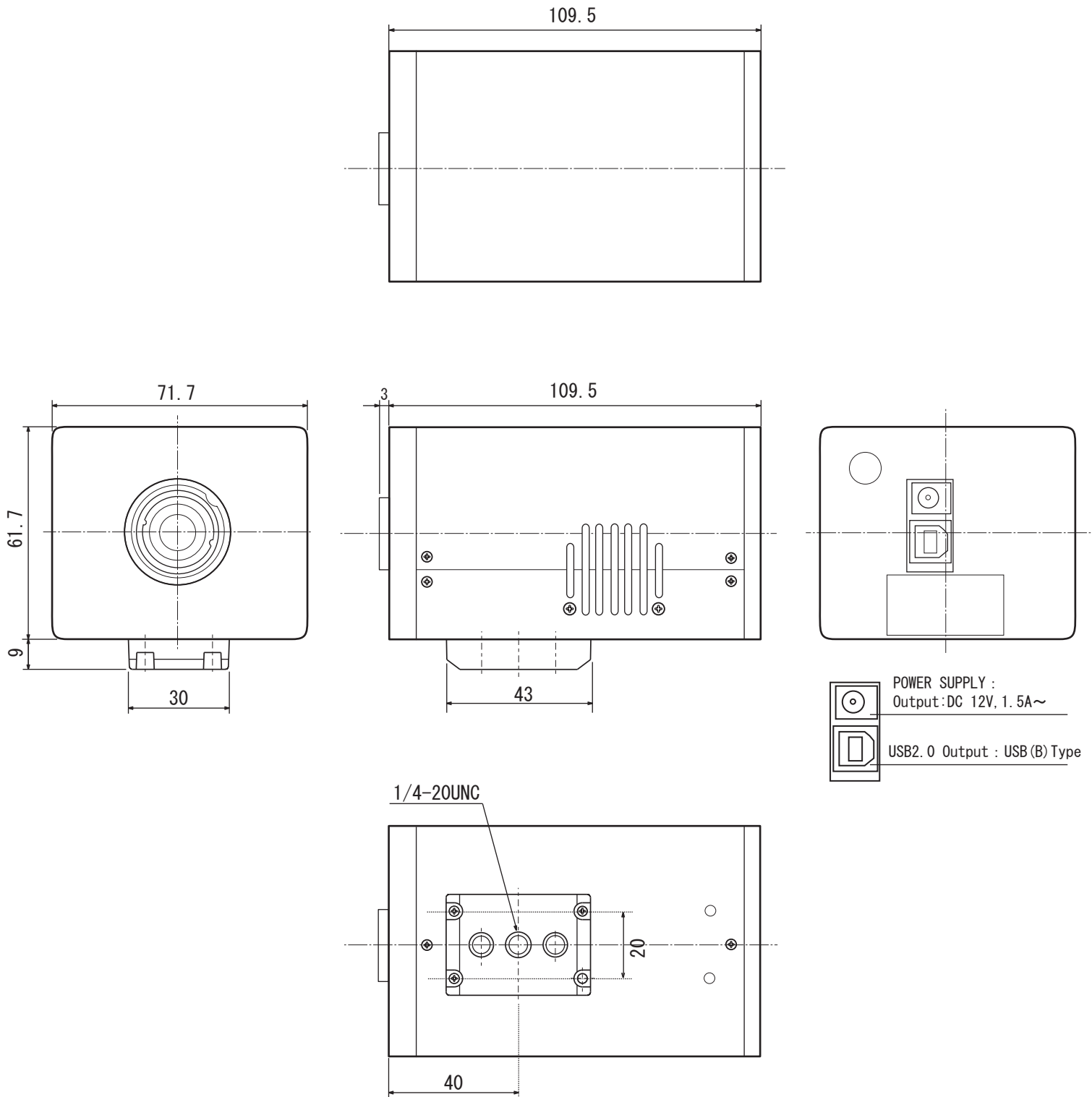
1-2 Specification List

Category	Specification	Memo
Sensor	Anti-Cooling Microbolometer	Built-in Peltier Device
Detective Wave Length	8~14 μ m	
Effective Pixel	320(H) \times 240(V)	
Pixel Pitch	23.5 μ m	
Temperature Resolution	L Range: <75mK H Range: <300mK	
Operability	>98%	Fixing defective pixels
Thermal Time Constant	16msec typ.	
8mm Lens FOV	50° (H) \times 37.5° (V)	
16mm Lens FOV	26° (H) \times 20° (V)	Option
Focus	1m~ ∞ , manual Focus	
Dynamic Range	L Range: -40~150°C H Range: 0~540°C	
Booting Time	\leq 15sec	Environmental temperature \leq 60°C
Measure Range	\pm 5%	
Frame Rate	30fps	
Serial Interface	USB2.0	14bit Bulk transfer
Power	DC 12V1A	I/P:AC 100-240V
Electricity Consumption	Below 10W	Environmental temperature 25°C
Running Temperature	-20~50°C	Below 80°C Non Condensing
Dimension	62(W) \times 72(H) \times 112(D) mm	
Weight	460g	Lens included

1-3 Dimension

Attention:

1. Measure unit is mm
2. Dimension is subject to change



1-4 Digital Interface

You can get microbolometer thermal image data through USB interface (Data length is 14bit).
You also can get temperature data using SDK (Option) for revised camera.
Please use SDK if you want to perform high quality measurement by your original application.

2. How to use

2-1 How to connect ARTCAM-320-THERMO camera to PC

- ① Insert the enclosed CD-ROM into computer driver.
- ② Connect the camera to the PC. (Use USB2.0 cable)
Use embeded USB2.0 port.

Recommended PC: Intel chip set and above ICH5
CPU speed: Above 1.7GHz
Memory: Above 1GHZ
Operation System: Windows XP/Windows Vista

Camera module starts booting. It will take about 15 sec to finish it.
After it's done, you can get thermal images.

- ③ Installation of device driver
Choose the [Driver] folder
(See the next page 'how to install')
- ④ Installation of viewer software
Copy the data from 「ArtThermo_v***」 folder in the CD-ROM to your PC.
(Copy all data to a same place, or software does not work properly)
- ⑤ Install is done. Then...

Check if ARTUST-0209D is shown at USB controller in device manager.

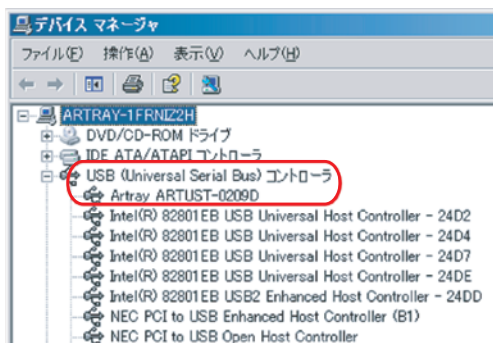
You can check USB controller from here:

Start > Control panel > System > Hardware > Device manager > USB controller

Operate 「Thermograph.exe」, after confirming of ARTUST-0209D at USB controller.

※ Please wait awhile starting viewer.

Because it would take about 15 sec to camera module finish booting up.



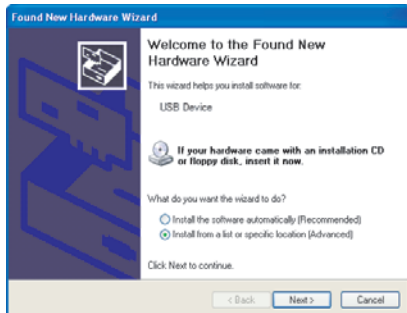
2-2 How to install USB2.0 camera driver

Insert the attached CD-ROM to your PC

When you connect the camera to a USB2.0, port a window below will be shown.

(Window view will be different depend on OS)

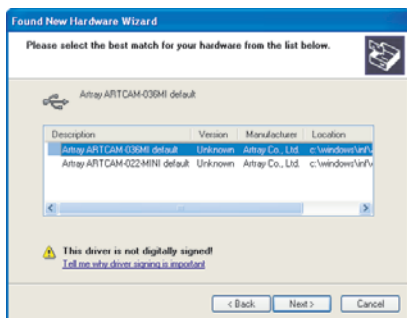
Choose the 「driver」 folder and install it to your PC.



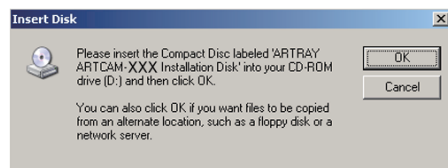
① Choose 「Install a software automatically」 and click “NEXT”.

Then installing will be automatically DONE.

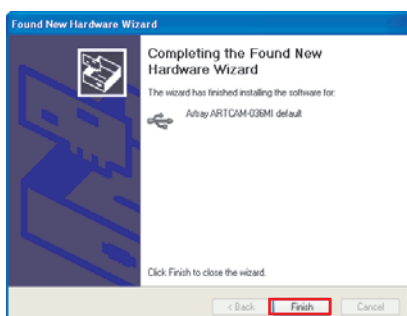
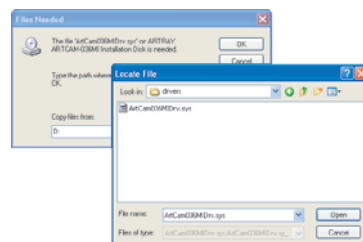
If not...
Follow the direction.



② Click “NEXT”



③ Click “OK” when left window is pop up. Click “Reference” when below window is pop up. Open “driver” folder and click “OK”

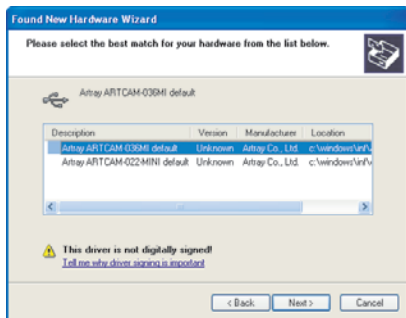


④ Click “DONE”
After awhile, next window will be shown.

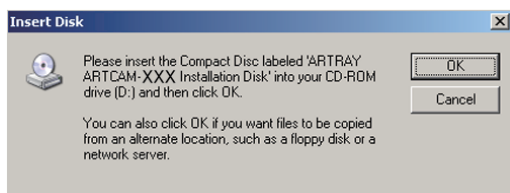


- ⑤ This window is shown once again.
 Choose 「how to install」
 Choose 「Install a software automatically」
 and Click “NEXT”.

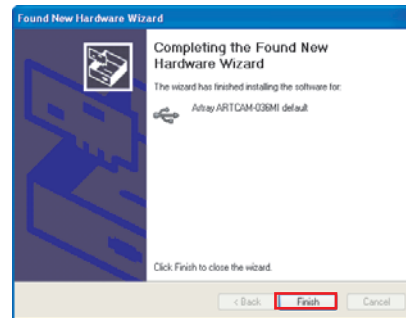
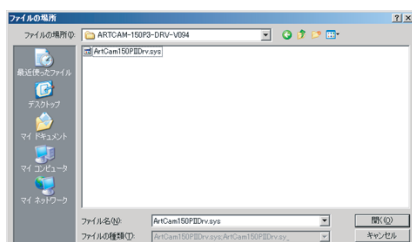
If installation does not start automatically,
 Follow direction on page8.



- ⑥ Click “NEXT”



- ⑦ Choose the device driver file from 「driver」 folder.
 Then, click “OK”



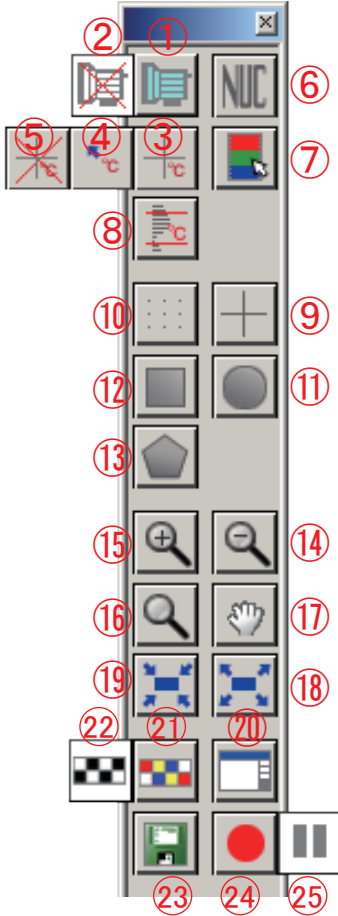
- ⑧ Click “DONE”
 you finally finish installing device driver.

If you succeed installing device driver, you see 「Artray ARTUST-0209D」 at USB controller.
 You go to USB controller from here:
 Start>Control Panel>System>Hard Ware>
 Device Manager>USB Controller

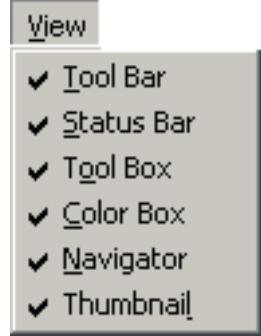
3 Viewer Software

3-1 Tool box/Tool bar

Tool Box



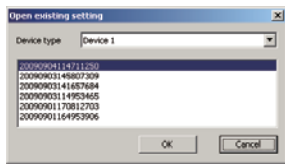
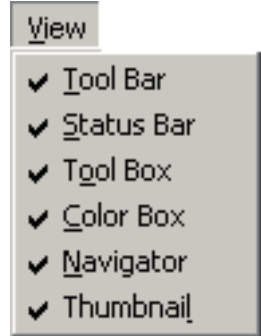
- ① Image window ON
- ② Image window OFF
- ③ Switch mode of a cursor point - Cross Cursor + Temperature
- ④ Switch mode of a cursor point - Only Temperature
- ⑤ Switch mode of a cursor point - None
- ⑥ NUC(See P13 for auto NUC)
- ⑦ Adjust temperature(See P12 for more detail)
- ⑧ Specify temperature setting for surveillance by click image window(See P12 for more detail)
- ⑨ Measure cross cursor
- ⑩ Measure point
- ⑪ Measure circle
- ⑫ Measure rectangle
- ⑬ Measure polygonal shape
- ⑭ Zoom out(+ Shift→Zoom in)
- ⑮ Zoom in(+ Ctrl→Zoom out)
- ⑯ 100% Magnification(+ Ctrl→Zoom out, + Shift→Zoom in)
- ⑰ Drag to move an image
- ⑱ Fit the image size to the present window size
- ⑲ Fit the window size to the original image size
- ⑳ Set up image window.
- ㉑ Color mode
- ㉒ Monochrome mode
- ㉓ Save still images or save measurement data
- ㉔ Start recording
- ㉕ Stop recording



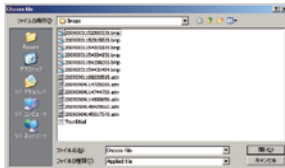
Tool Bar



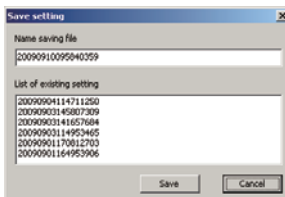
- ① New Window
- ② Load Camera Setting
- ③ Open File
- ④ Save Setting
- ⑤ Tool Box
- ⑥ Color Box
- ⑦ Navigator
- ⑧ Thumbnail
- ⑨ About



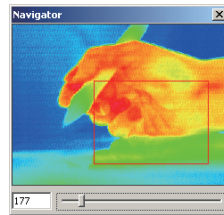
- ② Load Camera Setting
Load saved camera setting



- ③ Open File
Open saved still image or motion image (.atm).



- ④ Save Setting
Save camera setting. This screen is pop up whenever you close image window. When you want to use saved setting, please click ② Load Camera Setting



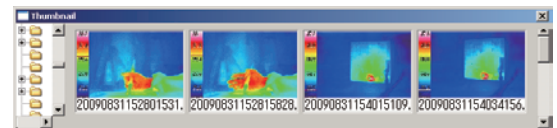
- ⑦ Navigator
Zoom in/zoom out your chosen area. (See P18 for more detail)



- ⑥ Color Box
Show the temperature range of image. (See P12 for more detail)



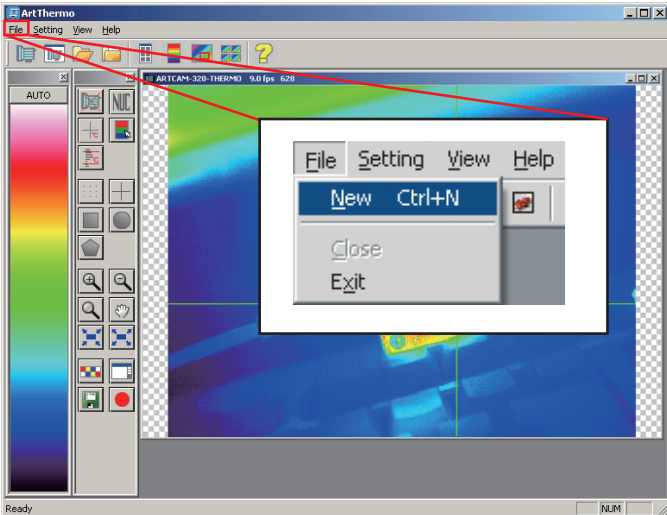
- ⑨ About
Indicate software version you use.



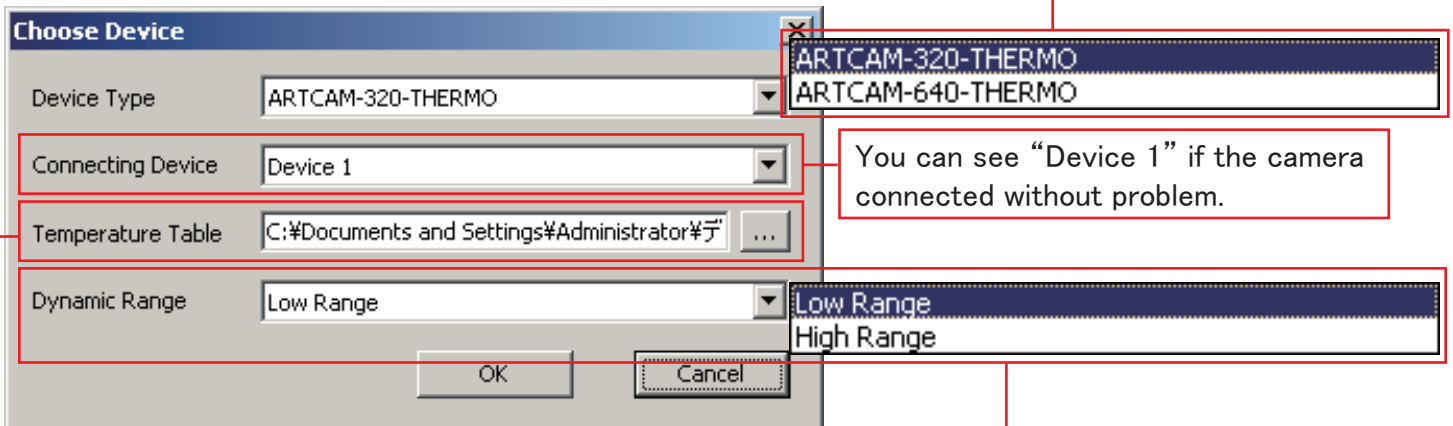
- ⑧ Thumbnail
Indicate inside of the folder you specified. Double click thumbnail to open still / motion images. (See P18 for more detail)

3-2 Operate the software

① Choose “New camera” from “File”



② “Choose Device” window is open. Choose device type you use.



ARTCAM-THERMO, you can choose from 2 ranges.

- L Range : -40~150°C
- H Range : 0~540°C

Choose Temperature Table

- L Range : TableLo.dat
- H Range : TableHi.dat

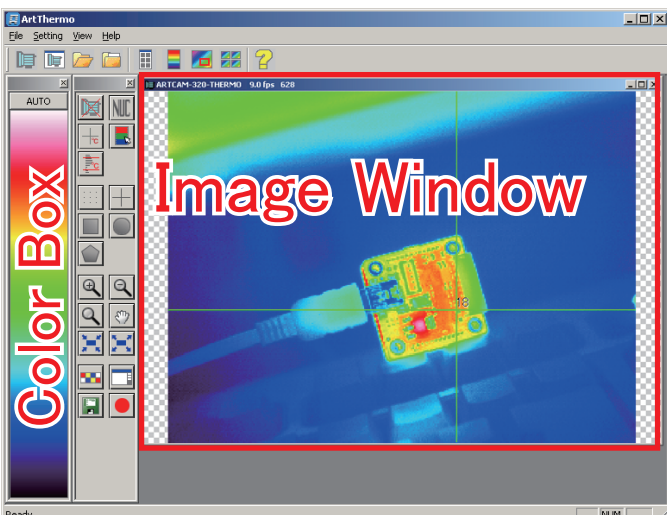
Choose Dynamic Range

- L Range : Low Ragne
- H Range : High Range

Click “OK”

③ Image window will be opened.

Temperature of the image will be reflected on color box.



3-3 Adjust Temperature



/Color Box/Temperature setting for surveillance

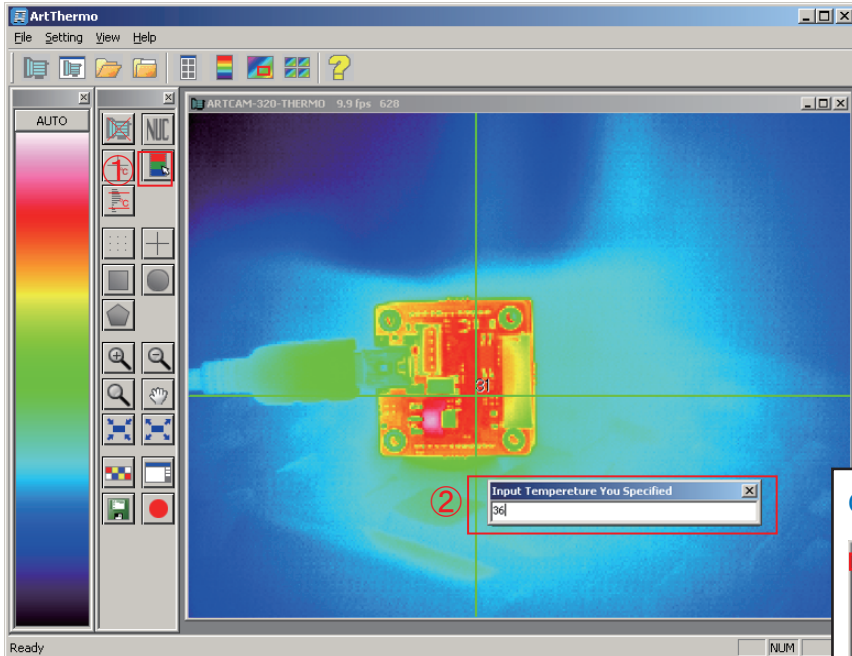


/NUC



① Adjust Temperature

Click on an image window. Input correct temperature* in that point to adjust temperature.

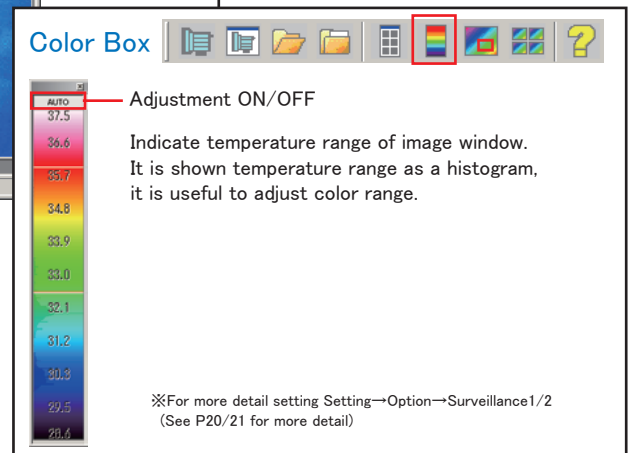


①Click appropriate point on the image window. And window ②“Input Temperature You Specified” is pop up.

Color box does offset correction followed by the temperature you input.

Adjusted temperature remains on software no matter if you close a software.

Temperature range of image window reflects on color box.

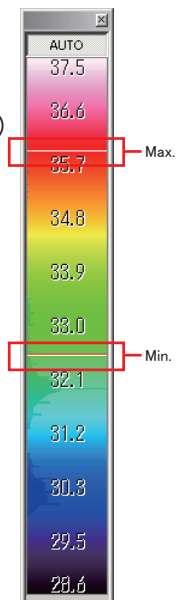
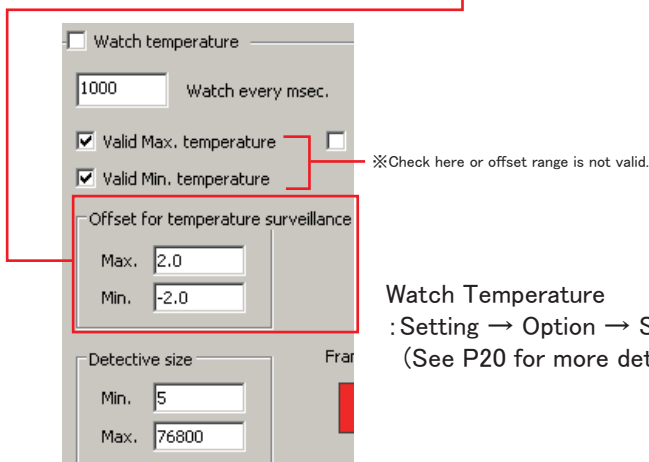


- * Please find correct temperature by using infrared thermometer.
- ** You can adjust temperature only one point. Even if you specify several points, these are covered by last specified temperature.
- *** When auto adjustment is off, you can do those functions:
Left Click: Move color box
Right Click: Change range of a color box



② Temperature setting for surveillance

Click image window to specify coordination to set up temperature range for surveillance. Click on the image window after choosing temperature setting button, and 2 red lines indicate maximum / minimum offset range (this is set up at option) of around choosing area.



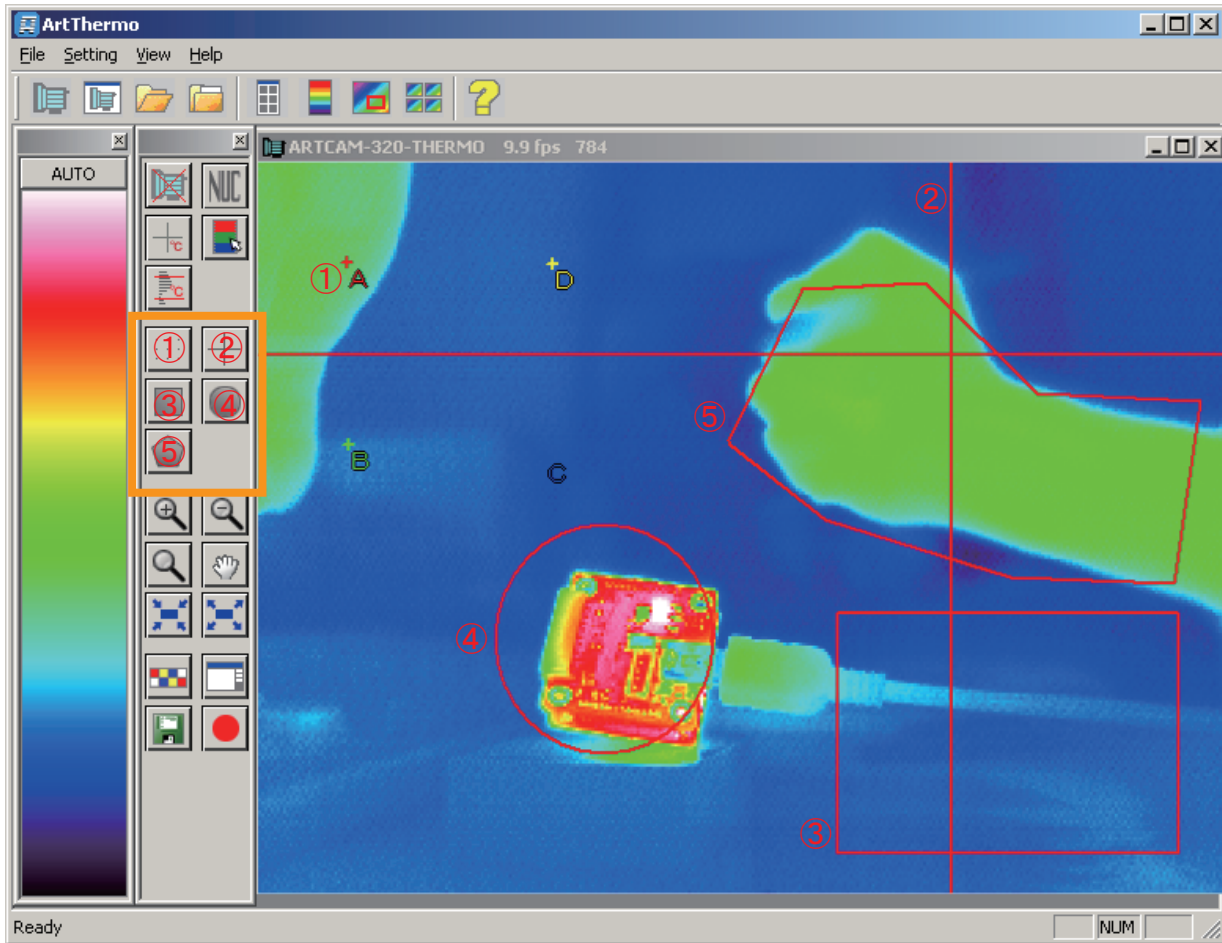
③ NUC

Drift and pixel correction of microbolometer

Auto NUC setting: Setting → Option → Camera(See P19 for more detail)


3-4 Measurement

Measured and make a graph of specified range of minimum temperature, average temperature and maximum temperature.



You can save measured graph as csv format. You can open it at Office Excel.

① Choose graph you want to save.

② Click  button and saving window is open. Choose a place you want to save to and click 「Save」



Saving window

	A	B	C	D	E
1	経過時間	平均	最高温度	最低温度	
2	0秒	32	35	31	
3	1秒	32	35	31	
4	2秒	32	35	31	
5	3秒	32	35	31	
6	4秒	33	35	31	

Open at Office Excel

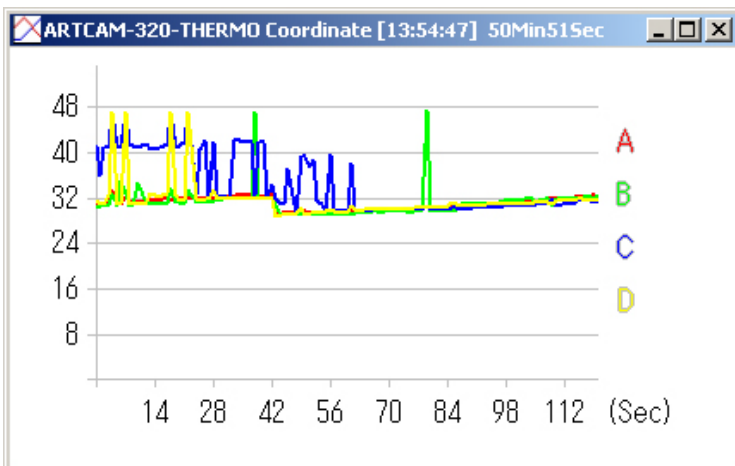
Detail setting:

Setting→Option→Graph

① Point



Measure points you specified.
Click points where you want to measure.
Right click to confirm, and a graph is shown.

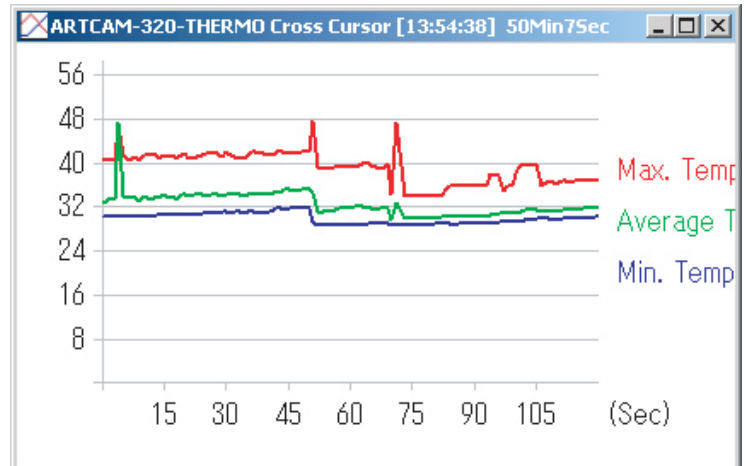


Graph is classified by number and color.
Right click on X coordinate / Y coordinate to change range of a graph.

② Cross Cursor



Measure on a cross cursor.
Click center of the cross cursor, and a graph is shown.

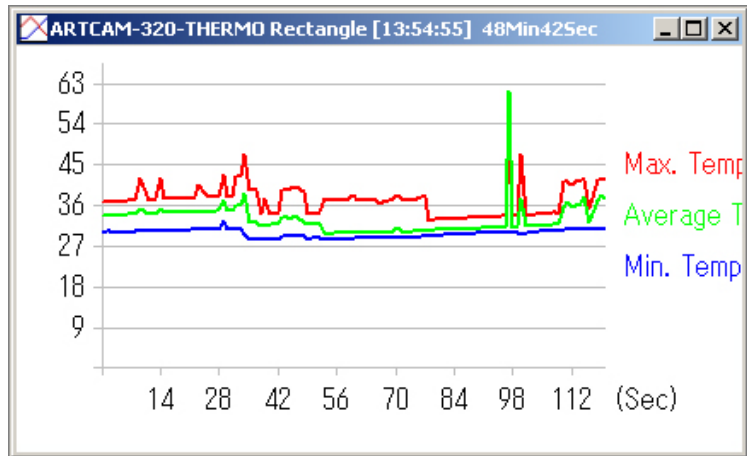


The graph is shown maximum temperature, average temperature and minimum temperature on the cross cursor.
Right click on X coordinate / Y coordinate to change range of a graph.

③ Rectangle



Measure in a rectangle area. Click first and last points to specify the range, and a graph is shown.

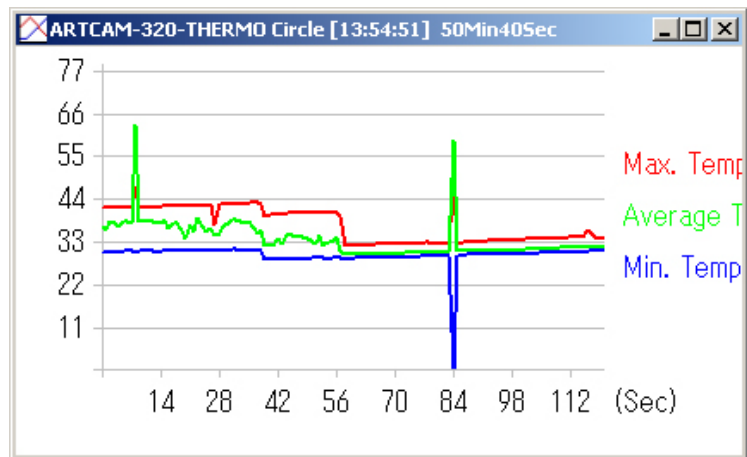


The graph is shown maximum temperature, average temperature and minimum temperature in the rectangle. Right click on X coordinate / Y coordinate to change range of a graph.

④ Circle



Measure in a circle area. 1st and 2nd click to specify circle's coordination, size and shape. Move circle to choose angle. 3rd click to confirm, and a graph is shown.

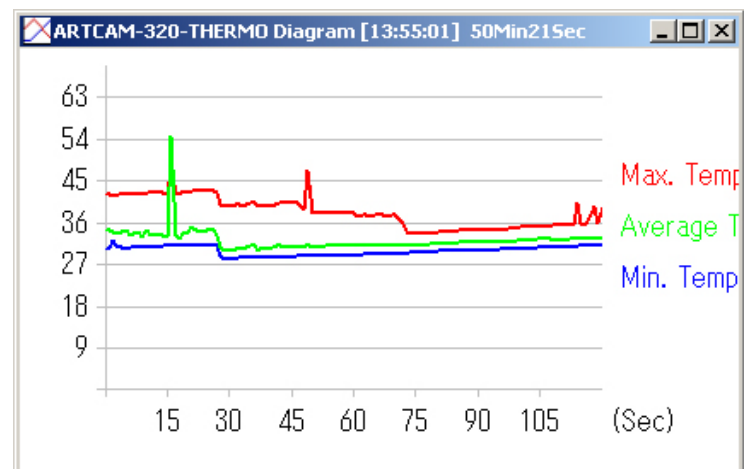


The graph is shown maximum temperature, average temperature and minimum temperature in the circle. Right click on X coordinate / Y coordinate to change range of a graph.

⑤ Polygonal Shape



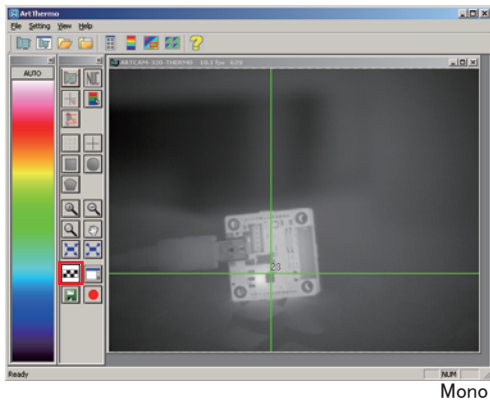
Click points to create polygonal shape. Right click to confirm, and a graph is shown.



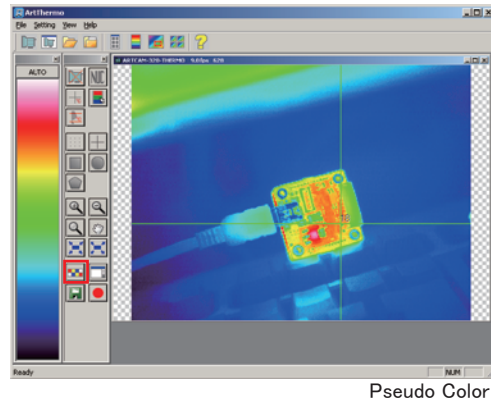
The graph is shown maximum temperature, average temperature and minimum temperature in the polygonal shape. Right click on X coordinate / Y coordinate to change range of a graph.

* Graph window can change its size and can move outside of the viewer software.

3-5 Pseudo Color/ Mono



Mono

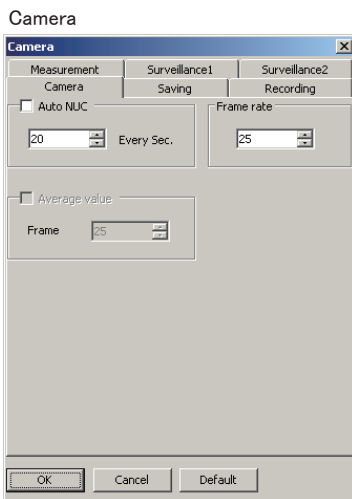


Pseudo Color

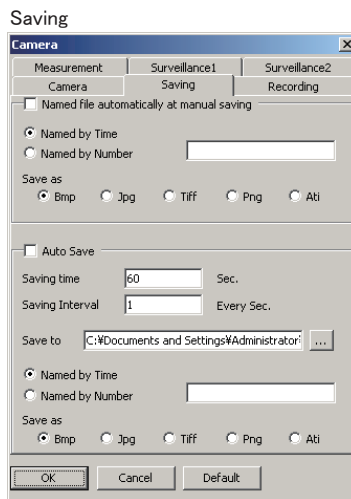
3-6 Set up image window



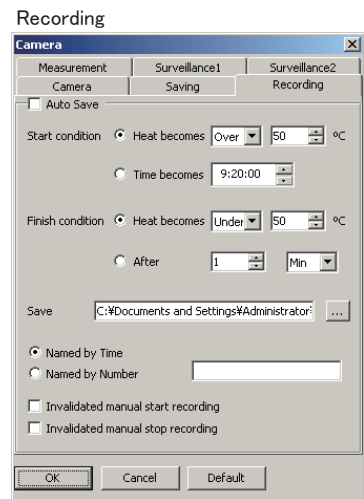
Individual setting for front image window. Setting under option is for default setting for all image windows. But this setting is correspond with each image window. And this setting continue to remain on each image window even you close window or change default setting.



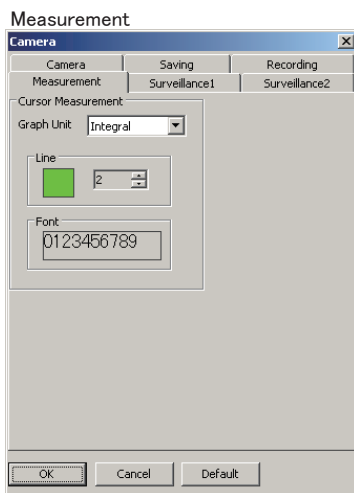
Set up auto NUC, frame rate



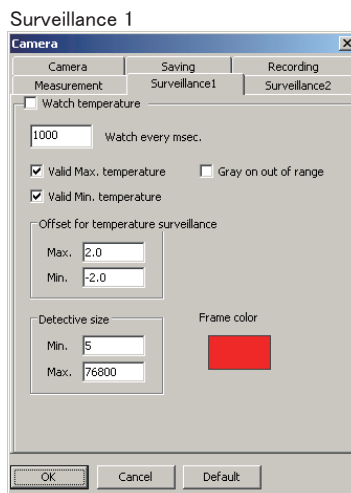
Set up how to save still image



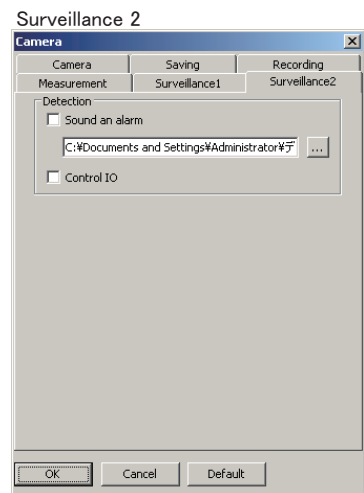
Set up how to save motion image



Set up measurement lines color, size and font



Set up range of surveillance and detect temperature automatically.



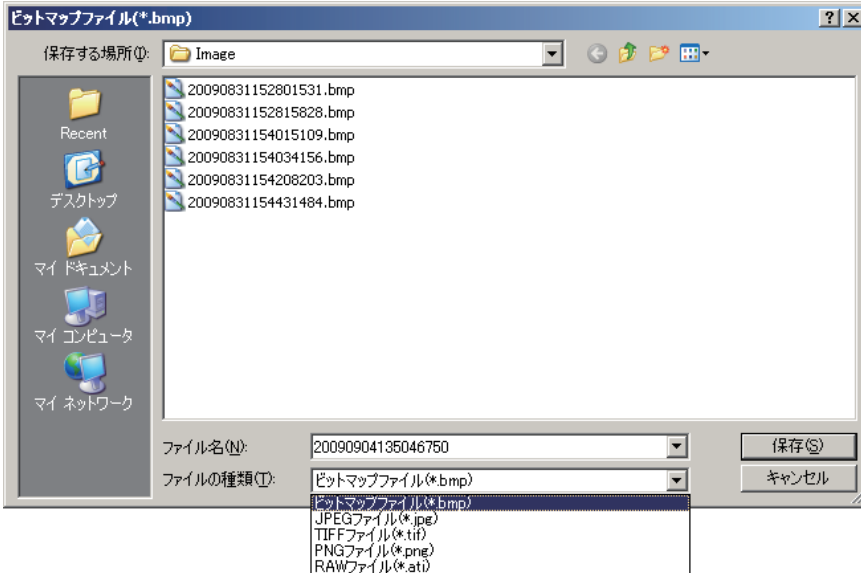
Extra setting for surveillance function.

See option page for more detail(P19)

3-7 Save still image

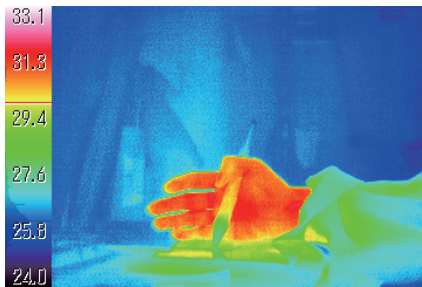
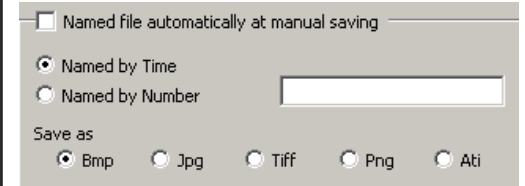


Manual saving



Choose image window and click . And left window is shown. Choose format you want to save as, and click 「Save」.

Data is named followed by your setting at 「Saving」. 「Named by time」 or 「Named by number」.

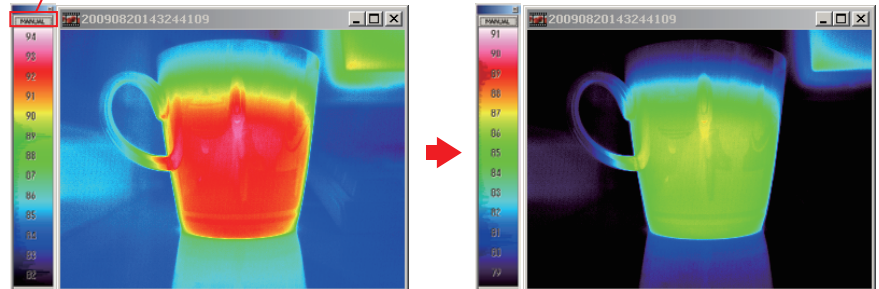


Color box image is also saved with image. If you save image as Bmp, Jpg, Tif, Png, you cannot change color setting.

Saving format 「Ati」

Ati format saves color box function, therefore, you can change color setting of a still image. *You can open Ati image only on our viewer software.

Set on 「Manual」. Bring cursor on color box and hand icon is appeared. Move hand icon from up to down to change color setting.



or



to open still image on the viewer software.

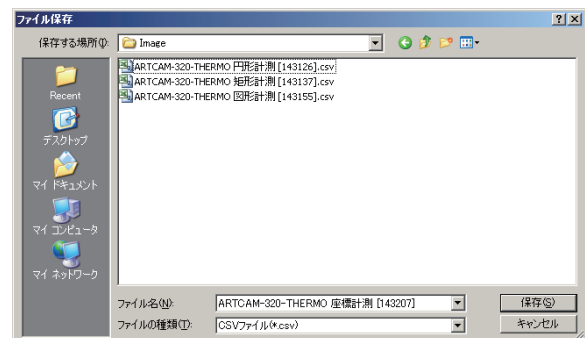
Open File Thumbnail

Save measurement result as a graph

Choose a graph you want to save and click . Right screen is appeared. Save as csv format. You can open csv format data at [Microsoft Excel](#).

Microsoft Excel - ARTCAM-320-THERMO 円形計測 [161834].csv					
	A	B	C	D	E
1	経過時間	平均最高温度	最低温度		
2	0秒	32	35	31	
3	1秒	32	35	31	
4	2秒	32	35	31	
5	3秒	32	35	31	
6	4秒	33	35	31	

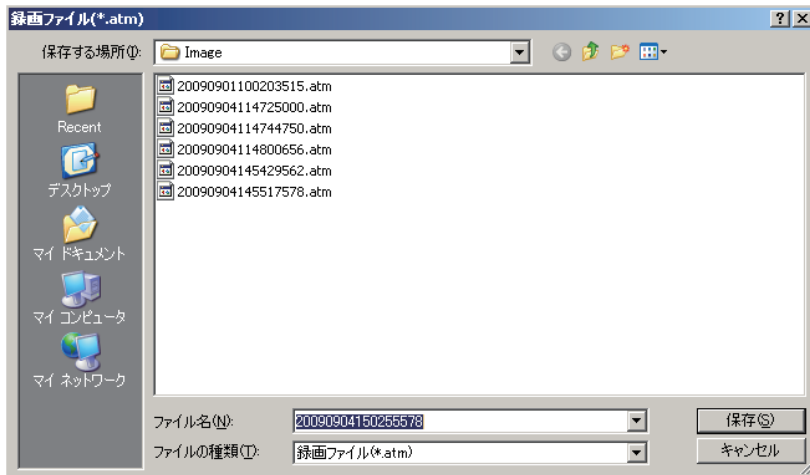
More detail setting: [Setting](#)→[Option](#)→[Graph](#)




3-8 Recording




Manual recording



Click . And left screen is appeared.

Save as atm format.

Click  to stop recording.

※Data is named by time unless you change it.



or



to open still image on the viewer software.

Open File Thumbnail

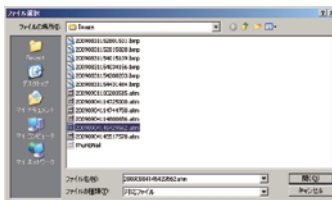
Convert to Avi format

atm format can open only at the ARTRAY original viewere software for ARTCAM-THERMO.
To view recording image at off the shelf software as like Media Player or Quick TIme,
please convert atm format to avi format.

①Open atm data, that you want convert, from 「Open File」 or 「Thumbnail」.



Open File



Choose a data and click 「Open」



Thumbnail

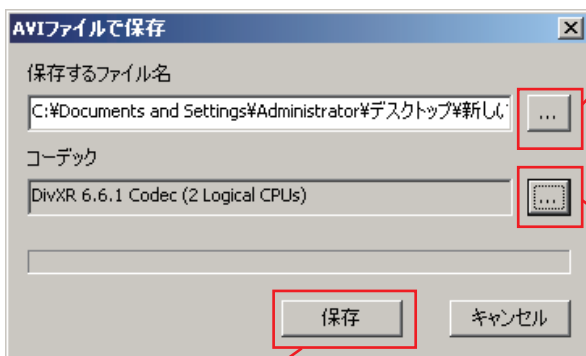


Double click thumbnail you want to open

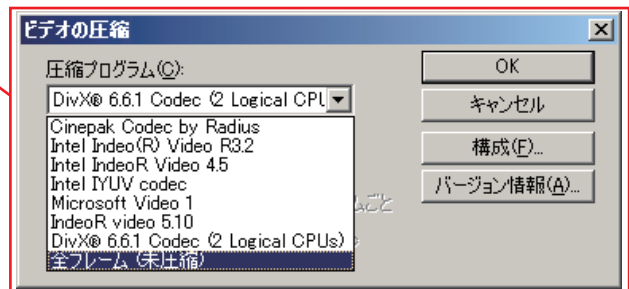
②Choose atm data and click



Window, to convert atm data to avi, is open



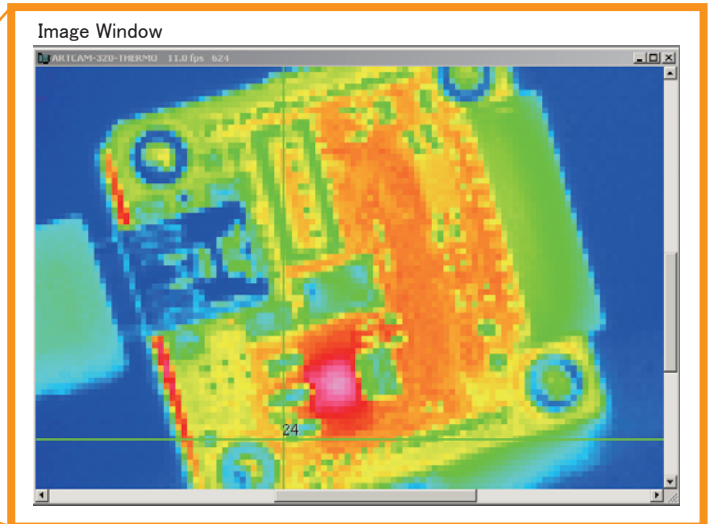
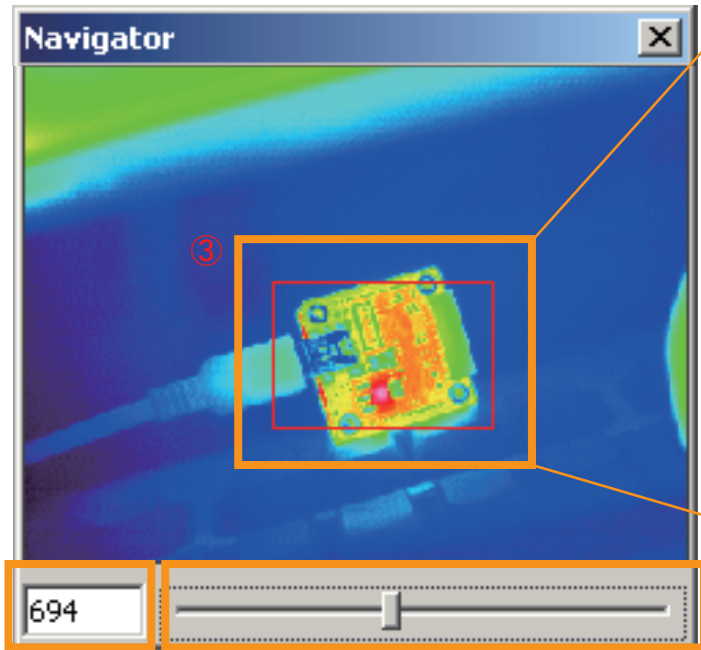
Choose a place to save and change name if you want to change.
Default setting, avi data is placed in the same place
as atm data.



Choose compressed program and click 「OK」

③Click 「Save」 and start converting

3-9 Navigator



Zoom in the area you choose at navigator window.

②

①

① Slide the bar to zoom in / zoom out. When magnification becomes above 100, red frame is shown on the window.

② Fill the number to zoom in / zoom out. 100 is 100% magnification. You can choose magnification from 1 to 1600.

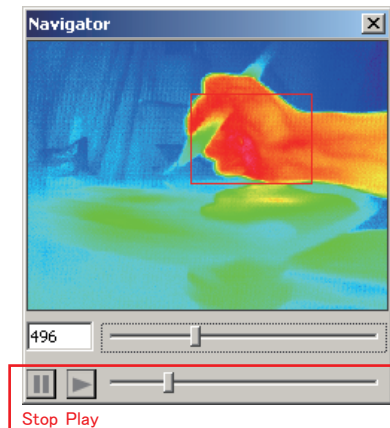
③ Indicate the area that is shown on the image window. It is appeared when you zoom in the image. You can move red frame to move showing area.

Navigator for recording (.atm) data

When you open recording atm data on the viewer software,

「Stop  」 and 「Play  」 is appeared to a navigator window.

You can play recording data manually with moving slide bar.
Zoom in / zoom our is as same as above explanation.

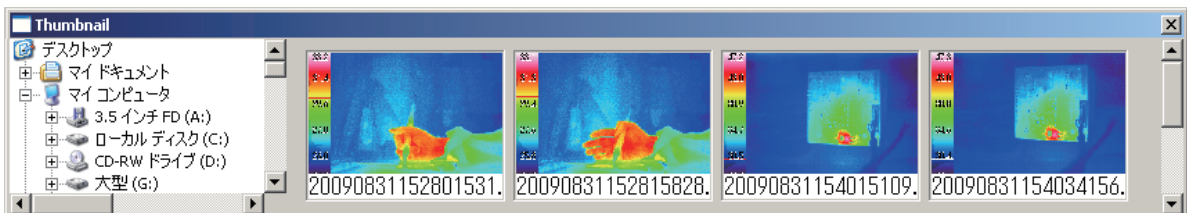


Stop Play

3-10 Thumbnail




Show the thumbnails of still/redording images in a folder.
Double click thumbnail to open on the viewer software.

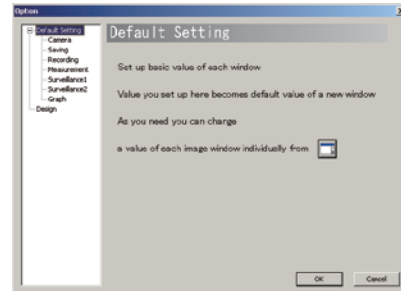


4. Option

Set up default setting of all image windows.

You can do individual setting from  button at the tool box.

4-1 Default Setting



4-2 Camera

① Auto NUC

Auto NUC setting

Check by Auto NUC and click [OK] to close the window.

*Reboot the viewer software to reflect the setting.

② Frame Rate

Set up appropriate number and click [OK] to close the window.

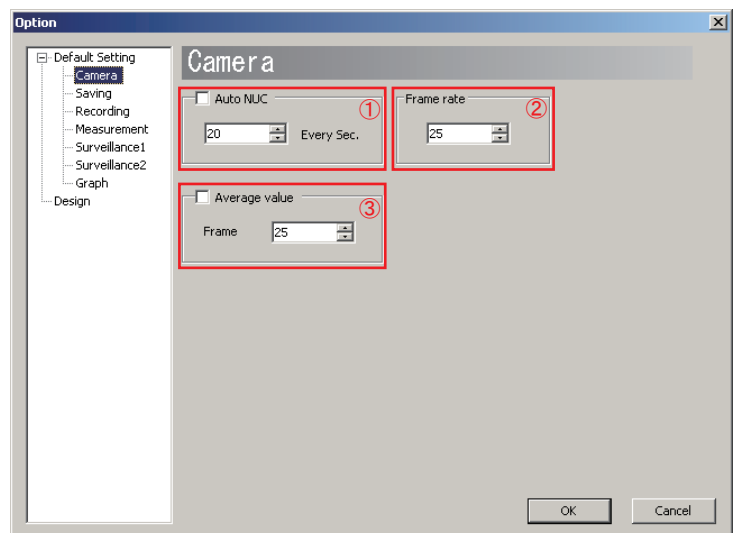
*Reboot the viewer software to reflect the setting.

③ Average Value※

Image window always shows updated temperature range and it caused twinkling.

Check by Average Value and take average of every frame number you filled out. It will reduce twinkling problem.


※Afterimage sydorome is occured because it takes average value. This function is good for still images.



4-3 Saving

Set up for saving still image 

Manual

① Check on [Named file automatically at manual saving] and whenever you click  button, images are saved as you specify at ②③④ and saved.

② Named by real time

Eg. November 15th. 2009 AM09:11 200911150911XXX.bmp

③ Named by number

Eg. [Appropriate words]0001.bmp, [Appropriate words]0002.bmp...

④ Choosing saving format

※Ati is ARTRAY's original saving format. See P16 for more detail.

Auto

⑤ Check on [Auto save] and images are automatically saved as you specify at ⑨⑩⑪.

⑥ Set a time how long you save

⑦ Set a interval time between still images while saving.

⑧ Specify where to save. At the manual saving, whenever you save, you are asked where to save.

⑨ Named by real time

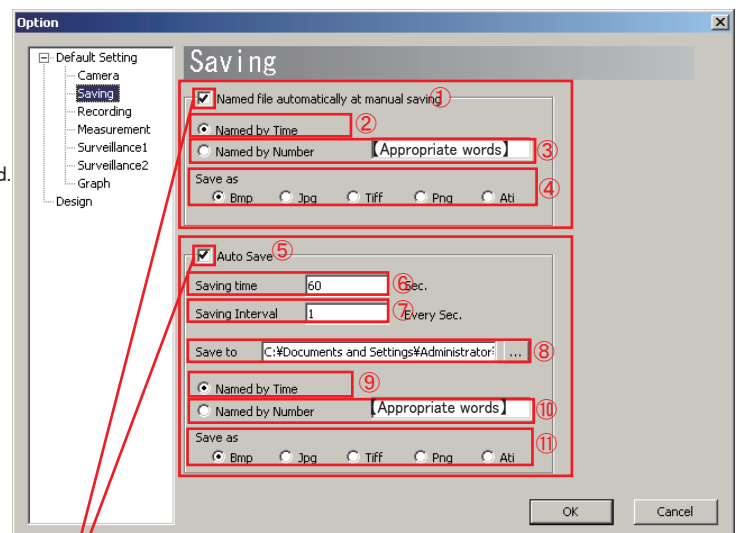
Eg. November 15th. 2009 AM09:11 200911150911XXX.bmp

⑩ Named by number

Eg. [Appropriate words]0001.bmp, [Appropriate words]0002.bmp...

⑪ Choosing saving format

※Ati is ARTRAY's original saving format. See P16 for more detail.





Choose how to save Manual or Auto and check

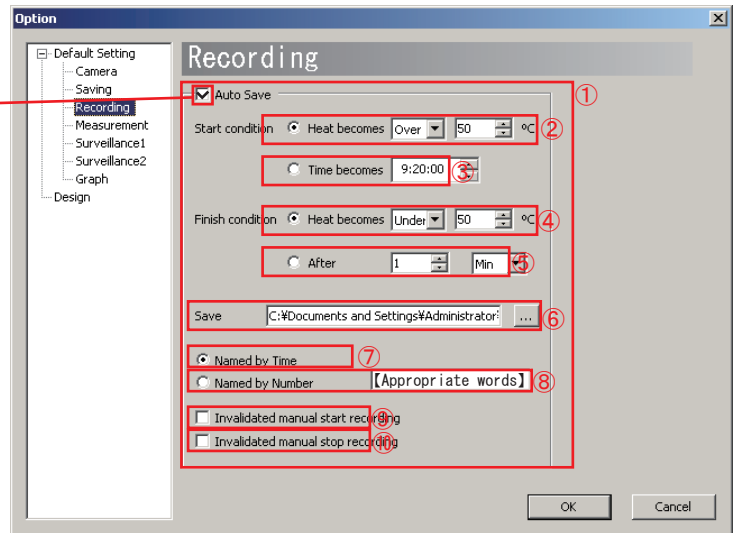
4-4 Recording

Set auto recording

(Check on **[Auto save]** and setting is reflected)

- ① Record automatically under a condition you specify
- ② Start recording automatically when temperature is reached to specified maximum/minimum temperature.
- ③ Start recording when specified time comes.
- ④ Stop recording automatically when temperature is reached to specified maximum/minimum temperature.
- ⑤ Stop recording when specified time comes.
- ⑥ Specify saving directory
- ⑦ Named by real time
Eg. November 15th. 2009 AM09:11 200911150911XXX.bmp
- ⑧ Named by number
Eg. [Appropriate words]0001.bmp, [Appropriate words]0002.bmp...
- ⑨ Invalidate manual start recording. 
- ⑩ Invalidate manual stop recording. 

*⑨⑩ are valid only when "Auto Save" is marked

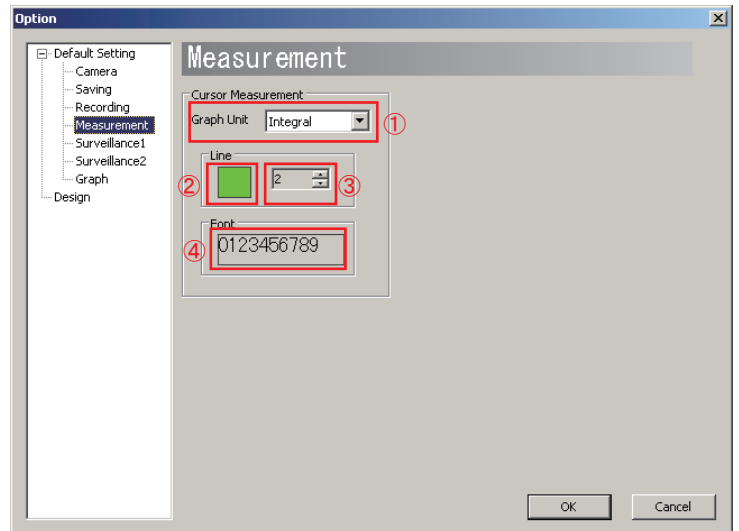


4-5 Measurement

Choose measurement's line, size and font

- ① Change a cursor style.
You can choose till second decimal.
- ② Choose color of a cross cursor.
- ③ Choose line size of a cross cursor.
- ④ Choose a font.

* Reboot to reflect setting



4-6 Surveillance 1

Specify temperature range and indicate by framing.

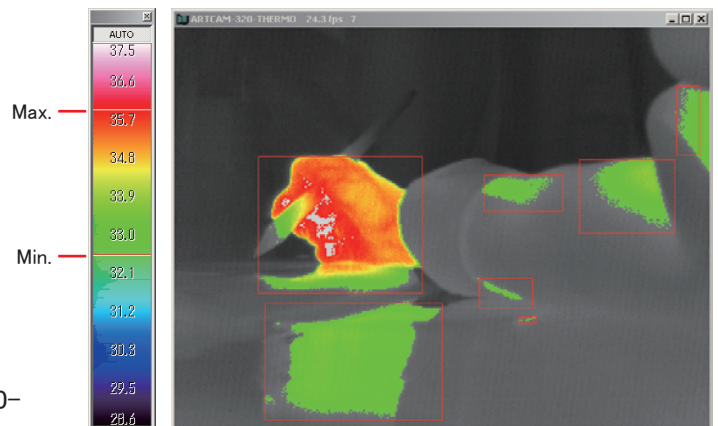
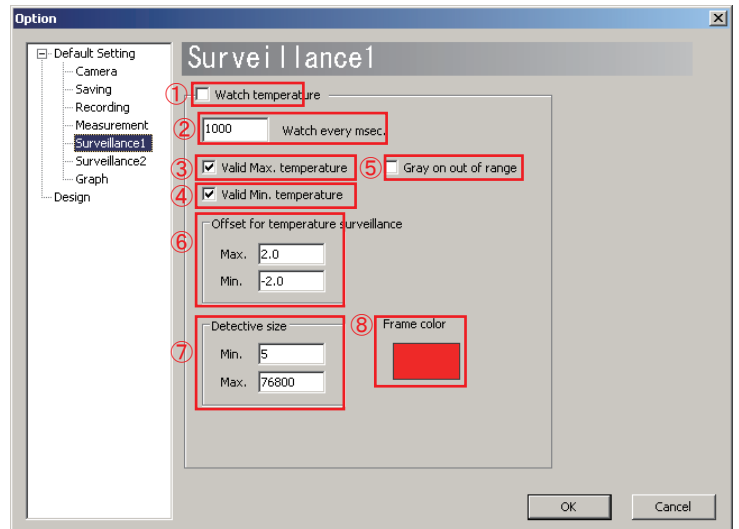
- ① Check by **[Watch temperature]**, framed specified temperature between maximum and minimum temperature that is set up at color box. Meanwhile, center window is appeared and indicate how many frames are currently shown on the image window.



Counter Window

- ② Specify updating interval (1000mm sec=1sec.)
- ③ Set up maximum temperature.
If you do not set up it, all images above minimum temperature are selected.
- ④ Set up minimum temperature.
If you do not set up it, all images below maximum temperature are selected.
- ⑤ Gray on all excluded area
- ⑥ Set up offset value of temperature surveillance
- ⑦ Specify detected size to frame. If you do not specify every single small pieces are selected. (Unit:pixel)
- ⑧ Choose frame color

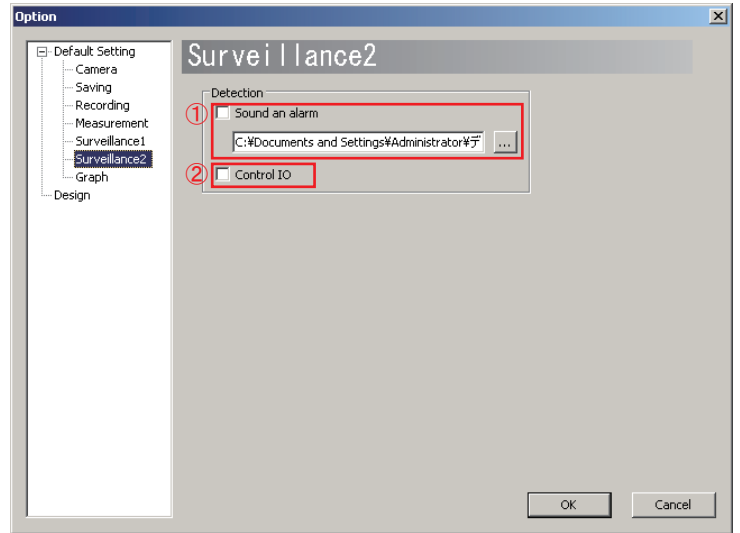
* Reboot to reflect setting



4-7 Surveillance 2

Special setting for surveillance

- ① Alarmed when temperature reaches to the range you set up.
Choose alarm sounds from 「…」.
- ② Control external I/O. Eg. Error function.



4-8 Graph

Set up graph

- ① Specified time unit (X coordinate) of a graph
- ② Specified temperature unit (Y coordinate) of a graph
- ③ Specified temperature unit. You can choose till first decimal.
- ④ Choose saving form of measurement result

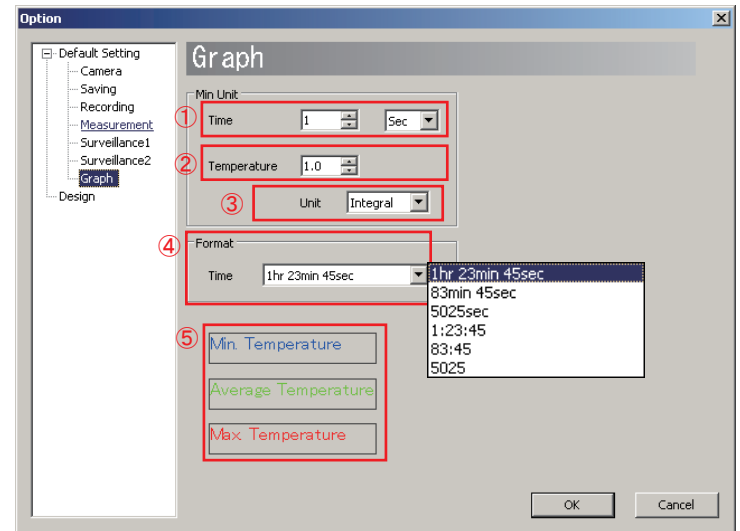
eg.

	B	C	D	E
1	経過時間	平均最高温度	最低温度	
2	0秒	32	35	31
3	1秒	32	35	31
4	2秒	32	35	31
5	3秒	32	35	31
6	4秒	33	35	31

	B	C	D	E
1	経過時間	平均温度	最高温度	最低温度
2	0.0000	32	35	31
3	0.0001	32	35	31
4	0.0002	32	35	31
5	0.0003	32	35	31
6	0.0004	33	35	31

- ⑤ Change color and font of minimum temperature, average temperature, and maximum temperature of a graph.

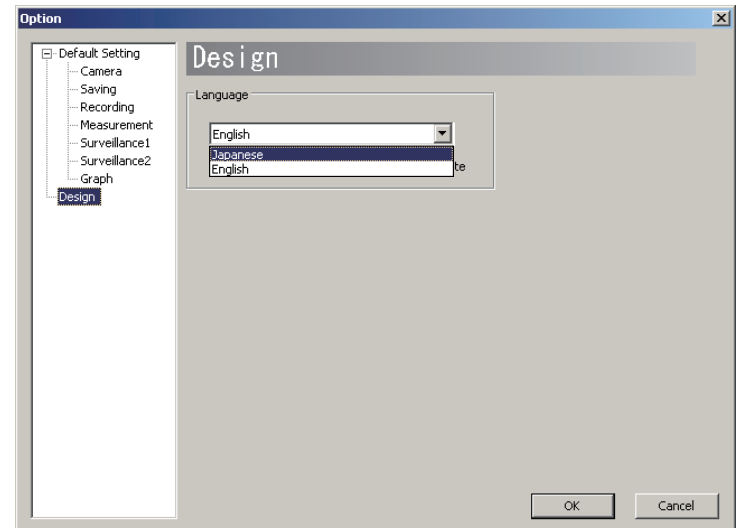
* Reboot to reflect setting



4-9 Design

Choose language Japanese / English

- * Reboot to reflect setting



5. Digital Raw Data

14bits thermal digital RAW data separates to 2bytes. And it is output from 8 D_VOUT0-7 datas. Then the data transfers to USB controller followed PC by packet unit.

6. Recommended PC

PC with Intel chip set and above ver. ICH5

*CPU: Pentium4 1.7GHz or higher

Embedded USB2.0 port (PCI/PCMCIA USB2.0 ports are not compliant)

*Memory: 1GB or higher

*Operation System: Windows XP/Vista

*Some PC (e.g. AMD CPU, USB which is not from Intel, or PC with host chip) would not work properly.

About export regulation

Our infrared thermal imaging camera ARTCAM-320-THERMO is the item which is under control of export regulation. Because it is possible to be used as a part of weapon. We need to report to the Ministry of Economy, Trade and Industry to receive the permission to export the Thermal camera to overseas.

Please understand that it will take time for the process to receive the export permission.

** Resell ARTCAM-320-THERMO

Whenever you resell ARTCAM-320-THERMO, we have to report it to the Ministry of Economy, Trade and Industry .

Please be sure to report it to our sales representative before you resell the product.

Please keep all end user's usage information. And show us whenever we request.

Thank you

* All functions are subject to change.

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