ThermalTronix

TT-1060MD-FTM Series

Thermal Imaging Camera

User Manual

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General Information

CONVENTIONAL

⚠ Warning: The improper operation can cause the thermal imaging system the major damage。

⚠ Careful, attention, warning, danger: In the reminder operation should pay attention item

Note, hint, tip and consider: to operates the content and explanation. Please read **"WARNING" & "CAUTION"** in the operation manual attached to the product carefully for proper operation before using the product.

Warnings & cautions

- An infrared camera is a precision instrument and uses a very sensitive IR detector. Pointing the camera towards highly intensive energy sources-such as sun or devices emitting laser radiation or reflections from such devices-may affect the accuracy of the camera readings, or even harm-or irreparably damage-the detector, whether the power supply of the camera is switch on or off.

- Avoid incorrect operation methods such as heavy pressing, shock or strong vibration during the course of transportation, store and installation otherwise the product could be damaged.

- For protective reason please keep the product in the environment between -40℃ and +70℃ during the course of transportation and storage. Original packaging box should be used during transportation.

- For protective reason the camera should be stored in shady, dry and draughty environment, avoids electromagnetic interference.

- Do not use the camera in a manner not specified in this manual or the protection provided by the equipment may be impaired.

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1. Introduction

Thank you for choosing the **TT-1060MD-FTM** thermal imaging camera (referred to hereafter as "camera" or "**TT-1060MD-FTM**").

The **TT-1060MD-FTM** uses the high sensitive UFPA detector. Simply connect the camera to a PC or a monitor and produce high-quality real-time images.

Its low weight, ruggedness and compacted. Fully configured I/O functionality allows the **TT-1060MD-FTM** either to be integrated quickly and easily in your control systems or to be set up as a stand-alone system. Real time color or voice alarm offer.

The **TT-1060MD-FTM** is available in RJ-45 Ethernet models that are ideal for individual or network multiple camera installations.

Accessories

The **TT-1060MD-FTM** and its accessories are delivered in an appropriative transport case, which typically contains the items below:

- **TT-1060MD-FTM** thermal image camera
- 2m network cable(Special cross-connect network cable)
- Power cable
- Technical specifications
- Video cable
- Users manual
- Users CD（Include: demonstrate software, users manual CD）
- Transport case.

2. Technical specifications

Refer to **technical specification** in transport case.

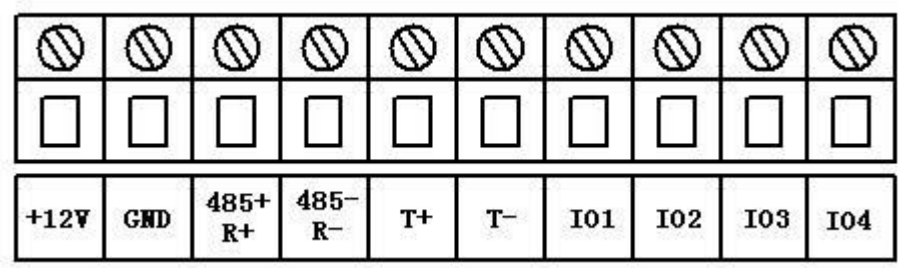
3. Connections & Buttons Description

3.1 Connections

Figure 3.1

1. **Ethernet Port:** For data and information transfers.
2. **Analog Video Output Connector:** Connect large monitors for viewing.
3. **Power Supply Connector:** Connect to power supply
4. **Serial Communication and I/O Port:** Digital (TTL) output/input, YUN terrace communication and user-defined pins.

IO port output function recommended connection.



Output definition（form left to right）:

Item	Power supply		Serial port			Common IO and COM ports				
definition	+12V	GND	RS485+ /R+	RS485- /R-	T+	T-	GPIO1 （ voice alarm output）	GPI O2	GPI O3	COM

Description:

1. Power in：+12V，GND
2. Serial port

   RS485 output：RS485+，RS485-

   4 terminals“RS485+/R+，RS485-/R-，T+,T-,”configuration:

Terminal	RS485+/R+	RS485-/R-	T+	T-

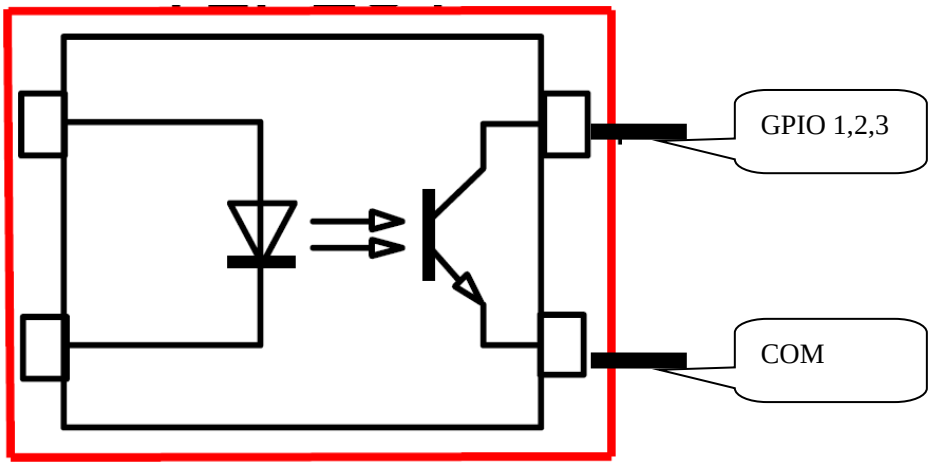
Mode 1	RS485+	RS485-	Spare	Spare
Mode 2	R+	R-	T+	T-

RS422 Output：

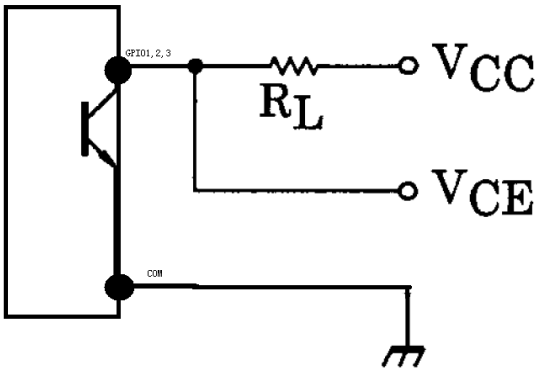
RS485 and RS422 changeable

3. GPIO 1，2，3 output：

1) Inside framework



2) recommended connection：



Item： VCC recommended：3.3V，5V，8V，12V。

RL recommended：10K

VCE Output control pin ， We suggest adding amplifying circuit if the circuit drives high current component.

Normal state： GPIO: High impedance. Temporality: VCE approximately equal to VCC；

Alarm state： GPIO: Low impedance .Temporality: VCC approximately equal to 0V；

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3.2 Buttons description

S Button	■ Press briefly to freeze an image ■ Press to leave freeze mode and go to live mode
Composite Buttons	■ Composite Buttons consist of UP, DOWN, LEFT, RIGHT and CONFIRM buttons. ■ Press confirm button to display the menu system ■ Press confirm button to exit the menu system ■ Press to confirm selections and leave dialog boxes ■ If the camera is in temperature measured mode press confirm button to display the attribute of spots, lines and areas ■ Press up/down or left/right buttons to navigate in menus, dialog boxes and on the screen. ■ Press up/down or left/right buttons to the spots position ■ If camera is in horizontal measured mode press up/down buttons to move the horizontal position, press left/right buttons to move reference point, vertical contrarily. ■ If camera is in area measured mode press up/down or left right to move the position of areas or resize the area.
C Button	■ Press to quit current operation ■ Press to leave freeze mode and go to live mode ■ If the menu system is inactive press and hold down C button for more than 3 seconds to autofocus.
A Button	■ Press and hold down for more than 3 seconds to autoadjust the camera. ■ Press to seriatim select the spot,line,area and palette. The chosen item will show in yellow, the number will change to '＊'mark and the corresponding result in result table will be displayed in yellow background.

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4. Operations

4.1 Interface

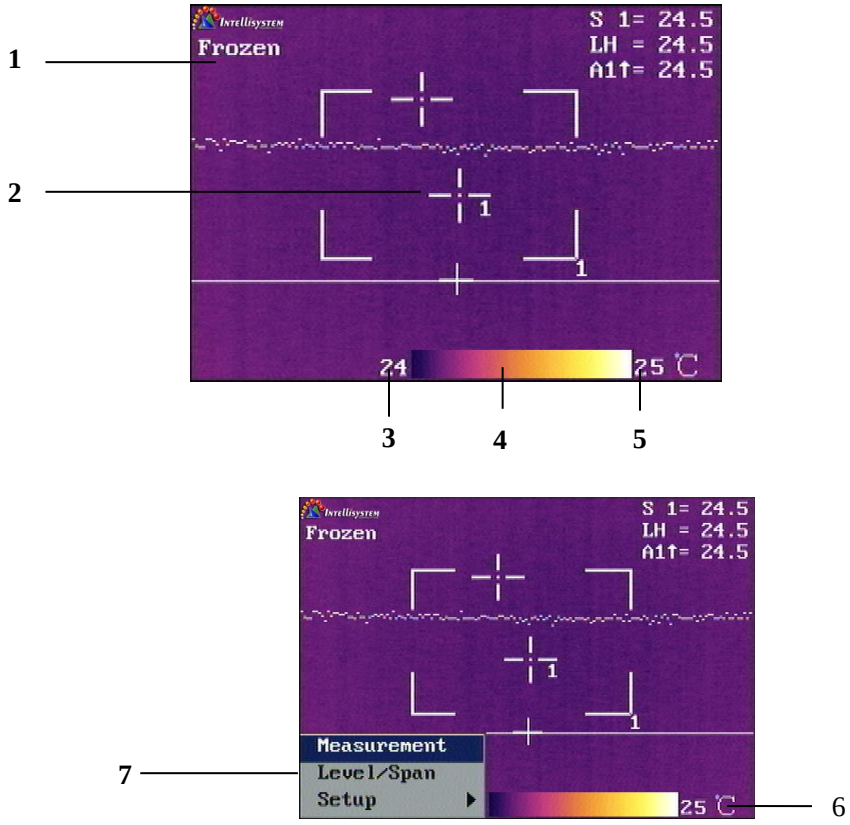

Figure 4.1

Callout	Item	Description
1.	Work mode	To display current work mode
2.	Crosshair	To display the position of a spot in the image
3.	Minimum temperature	The minimum temperature of the color palette
4	Color palette	To show the scale of the thermal image
5.	Maximum temperature	The maximum temperature of the color palette
6	Result table	To display the measured temperatures result of spots, isotherm and areas
7	Pull up menu	it is made up of **Measurement Level/Span** and **Setup.**

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4.2. Menu function description

The menu system includes a number of different menu objects. This section describes the menu objects.

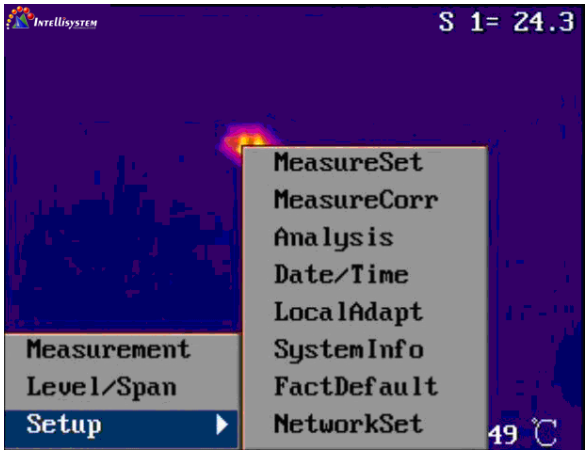


Figure 4.2

4.2.1 Temperature measurement mode

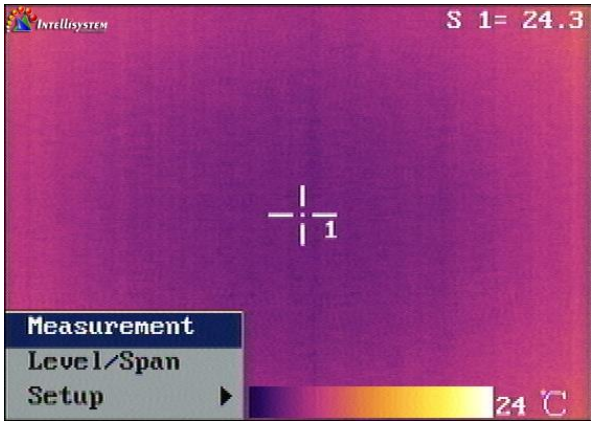
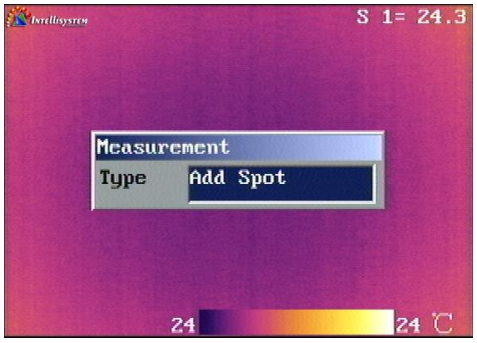


Figure 4.3

- Press confirm button to display the pull up menu.
- Point to **Measurement** item by pressing up/down buttons.
- Press the confirm button to display **Measurement** dialog box.



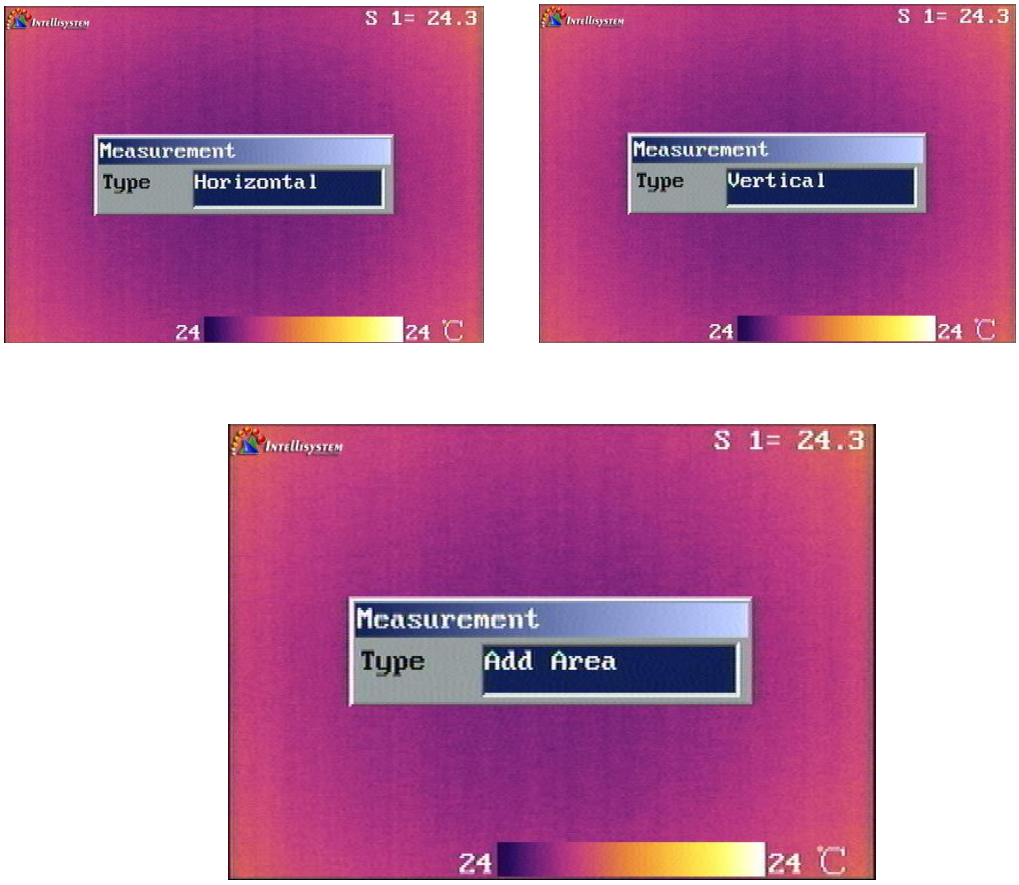


Figure 4.4

- Press left/right button to seriatim change the content with the sequence of **None**, **Add Spot**, **Horizontal**, **Vertical** and **Add Area**.

4.2.1.1 Spot

- Point to **Measurement** and then press the confirm button to display the **Measurement** dialog box.
- Press left/right button to select Add Spot and then press the confirm button. A spot will now appear on the screen. The measured temperature will be displayed in the result table in the top right corner of the screen. The temperature will show in shape with Sx=YY. For example: Like following figure S1=24.3 denote the temperature of the spot1 is 24.3℃, you can change the temperature unit.
- You can add 4 spots maximum.
- Press the A button to select the spot1, the selected item will be shown in yellow background and the mark will show in "*"you are now in edit mode.

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- Press left/right or up/down button to move the spot.
- Press the confirm button to display the attribute dialog. Press up/down to change the select item and press the left/right to change the value of emissivity or set the reference temperature.
- Press C button to delete the spot.

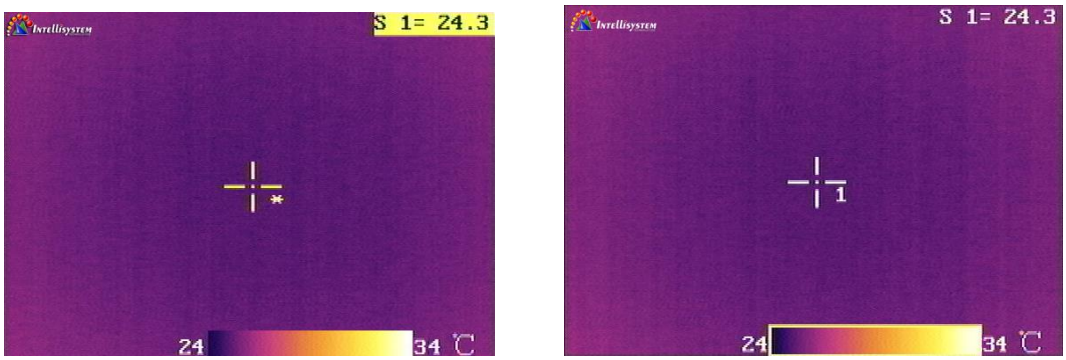
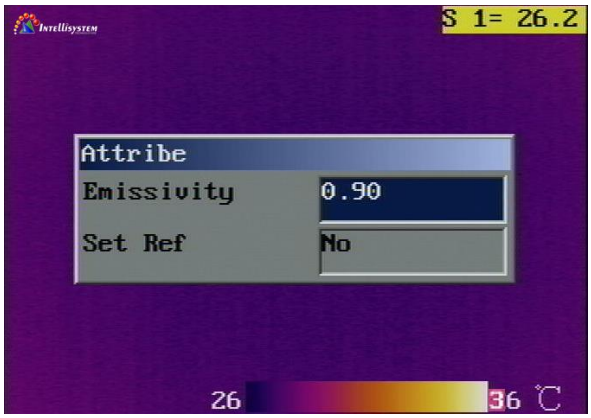


Figure 4.5

4.2.1.2 Horizontal



- Point to **Measurement** and then press the confirm button to display the **Measurement** dialog box.
- Press left/right button to select **Horizontal** and then press the confirm button. A line and a curve will now appear on the screen. The measured temperature will be displayed in the result table in the top right corner of the screen. The line indicates the measured position and the curve is the temperature distribution of the line.
- The temperature will show in shape with LH=YY to denote the intersection temperature of line and cross cursor.
- Press **A** button to select the horizontal and then the horizontal and the result will be show in yellow background, you are in edit mode.
- Press up/down button to move the horizontal and press left/right to move the cursor on the horizontal.
- Press confirm button to display the attribute dialog box, press left/right button you change the emissivity.

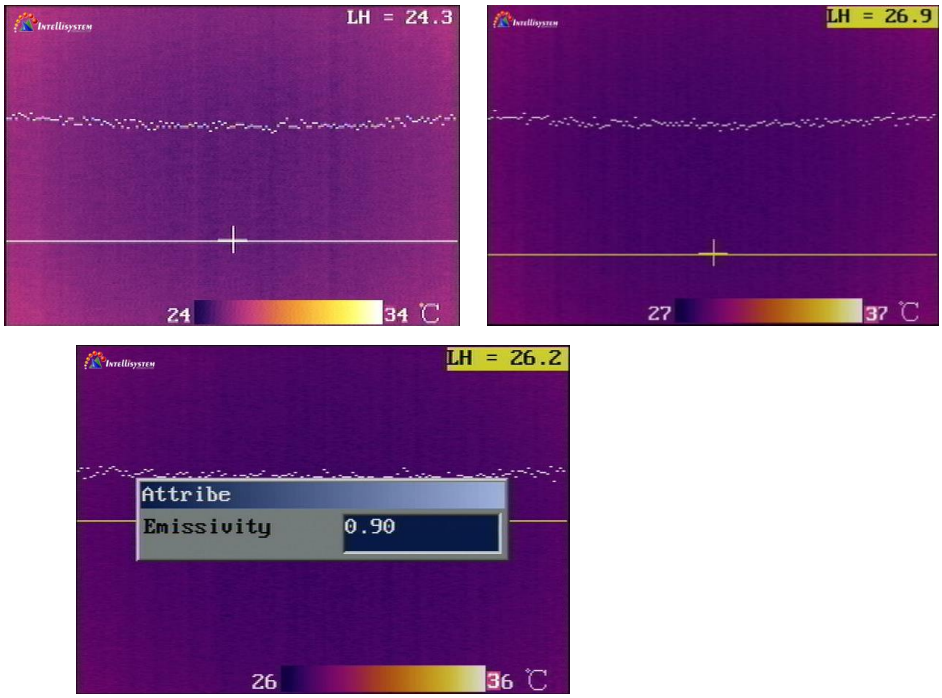


Figure 4.6

4.2.1.3 Vertical

- Point to **Measurement** and then press the confirm button to display the **Measurement** dialog box.
- Press left/right button to select **Vertical** and then press the confirm button. A line and a curve will now appear on the screen. The measured temperature will be displayed in the result table in the top right corner of the screen. The line indicates the measured position and the curve is the temperature distribution of the line.
- The temperature will show in shape with LV=YY to denote the intersection temperature of line and cross cursor.
- Press **A** button to select the vertical and then the vertical and the result will be show in yellow background, you are in edit mode.
- Press left/right button to move the vertical and press up/down to move the cursor on the vertical.
- Press confirm button to display the attribute dialog box, press left/right button to change the emissivity.

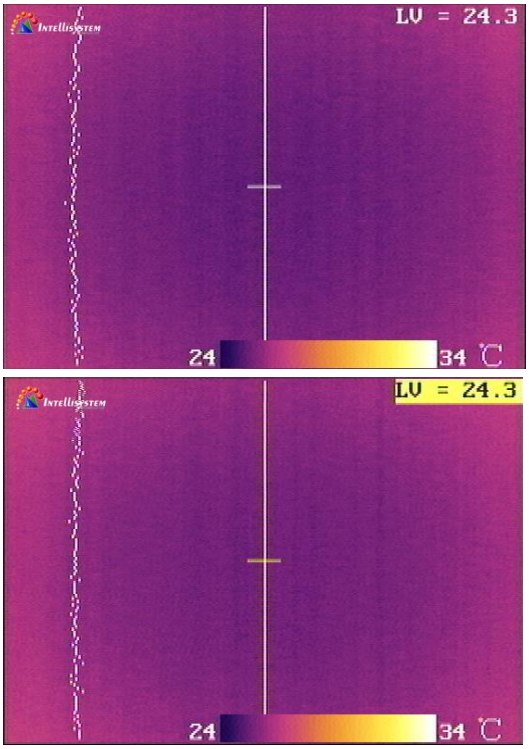


Figure 4.7

4.2.1.4 Area

- Point to **Measurement** and then press the confirm button to display the **Measurement** dialog box.
- Press left/right button to select **Add Area** and then press the confirm button. A temperature area will now appear on the screen. The measured temperature will be displayed in the result table in the top right corner of the screen.
- The temperature will show in shape with Ax↑=YY
- Press **A** button to select the area and then the result will be show in yellow background and the mark of the area will show in *you are in edit mode.
- Press up/down or left/button to move the area or resize the area.
- Press the confirm button to display the attribute dialog box

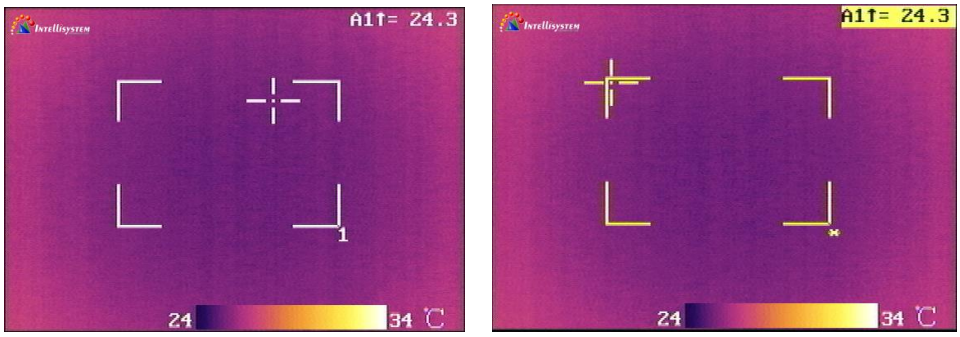


Figure 4.8

- Emissivity: Press the left/right button to change the emissivity.
- Set Ref: Set the current temperature as reference temperature.
- Area Type: To set the display temperature in result table, you can select maximum, average or minimum.
- Area Move: To set the function of press left/right and up/down button to move the area or resize the area.

4.2.2 Level/Span

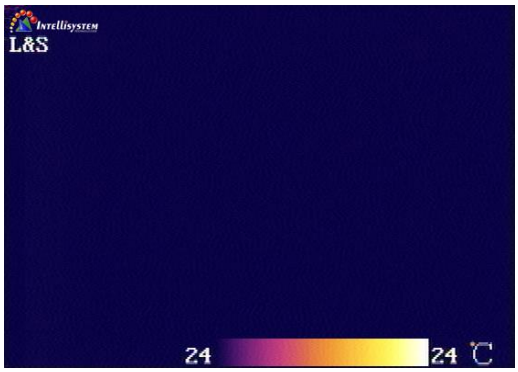
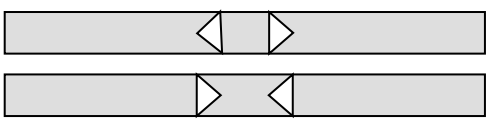
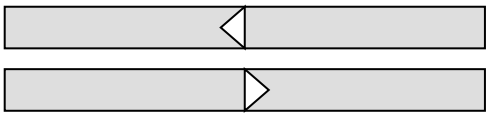


Figure 4.9

Point to **Level/Span** to and press the joystick to manually change **level** and **span**. The level command can be regarded as the brightness, while the span command can be regarded as the contrast.

- Press left button to decrease the span, press right button to increase the span (indicated by two arrows pointing away from each other or towards each other)
- Press up button to increase the level, press down button to decrease the level (indicated by an arrow pointing upwards or downwards in the temperature scale)





Symbols in the temperature scale, indicating (1) increasing span; (2) decreasing span;(3) decreasing level, and (4) increasing level

4.2.3 Setup

This menu contains all the functions for changing the camera setup parameters. This section describes the parameter setup.

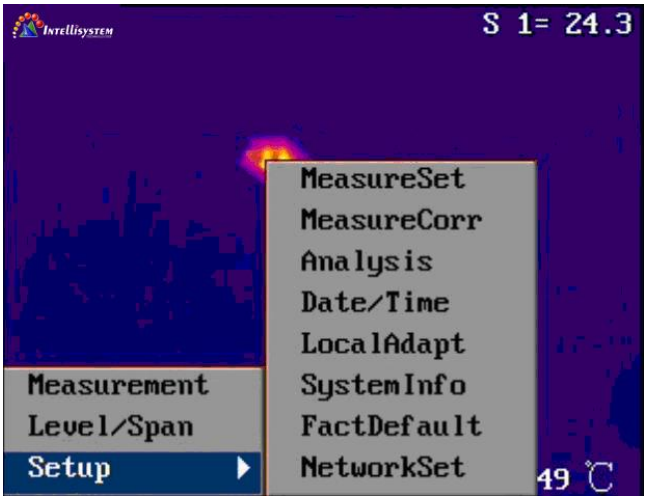


Figure 4.10

4.2.3.1 Measure Set

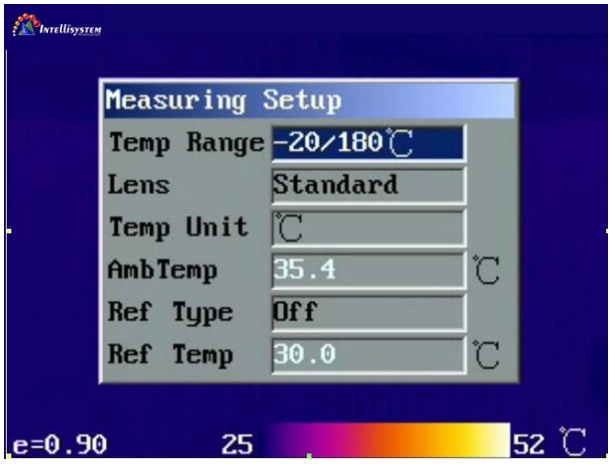


Figure 4.11

Point to Measure Set and then press the confirm button to display the Measuring Setup dialog box.

Label	Value	comments
Temp Range	-20~180℃	To set the temperature range it could not be adjust by user.
Optional Lens	Standard	To set the optional lens, set by manufacture
Temp Unit	℃ F K	To set the temperature unit,press left/right button to select unit.
AmbTemp	Adjustable	■ To set the atmosphere temperature between the camera and the target. ■ This value usually detect by camera it need not correcting unless you turn on/off the apparatus continually or the ambient temperature change quickly. ■ Briefly press left/right button to adjust 0.1℃, press and hold down left/right button to adjust 1℃.
Ref Type	On/off	■ Select **On** to set the reference temperature ■ Select **Off** to disable the reference temperature ■ When it is on, the temperature result table will show the temperature difference between the object's temperature and reference temperature.
Ref Temp	User-defined	■ You can set the reference temperature if Ref Type is **On**. If not this option will be shaded. ■ The reference temperature can be used when the camera calculates temperature differences

4.2.3.2 Measure Correct

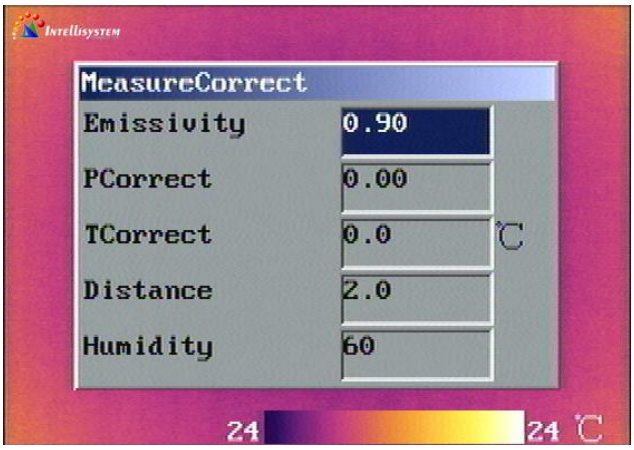


Figure 4.12

Label	Value	comments

Emissivity	User-defined (0.1~1)	To set the emissivity Typical emissivity for a variety of common materials are listed in **appendix 1**.The value are meant to be used only as a guide and can vary depending on many different factors.
P Correct		To set the system's parameter correction(Usually set by manufacture)
T Correct		To set the system's temperature correction(Usually set by manufacture)
Distance	User-defined	You can set the distance by manual.(It's better to set as the actual distance and accurate to 0.5 meter if the distance within 10 meters)
Humidity	User-defined	To set the current environment humidity. Increase or decrease the value by pressing the left/right button.

4.2.3.3 Analysis

Figure 4.13

Label	Value	Comments
Color Rule	Open/Close	To set the palette hide or show on the screen
Temp Alarm	Open/Close	This item setting defines whether the alarm should be triggered when the temperature exceeds or drops below the alarm temperature.
Alarming Temp	User-defined	To set an alarm temperature if **Temp Alarm** is opens. if not, this option will be shaded
Alarming Color	9 colors to be chosen	To set an alarm color when the **Temp Alarm** was selected **Open.** It will not change the original color of

		the screen when the alarm is triggered.
Isotherm Color	9 colors to be chosen	Sets an isothermal color. This setting command colors all pixels with the setting temperature. The isotherm levels will be displayed in the temperature palette.
Isotherm Temp	User-defined	Sets the temperature of the isothermal central point.
Isotherm Width	User-defined	Average distribute around the central isothermal point. If the isothermal temperature is 50℃, isothermal width is 2℃, and then the isothermal range will be 49℃ ~ 51℃.

4.2.3.4 Local Adapt

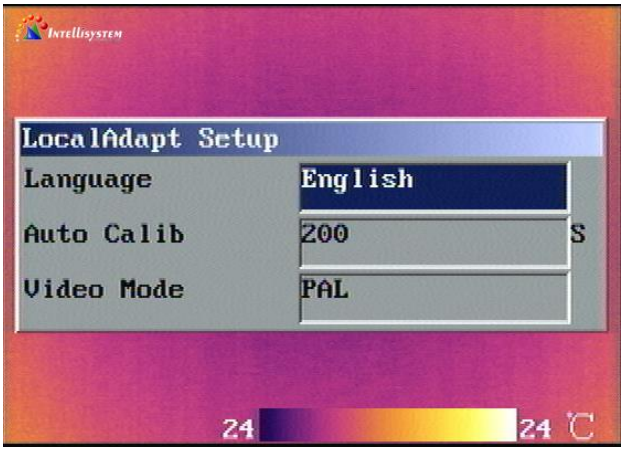


Figure 4.14

Point to **Local Adapt** and then press the confirm button to display the **Local Adapt Setup** dialog box.

Label	Parameter	Comments
Language	English/Chinese	Press left/right button to choose a language. The camera program will be restarted when you change the language. This will take a few seconds
Auto Calib	User-defined	To set auto calibration interval. Auto calibration is used to get the better image and increase the accuracy.
Video Mode	NTSC/PAL	To set the analog video output mode

4.2.3.5 System Info

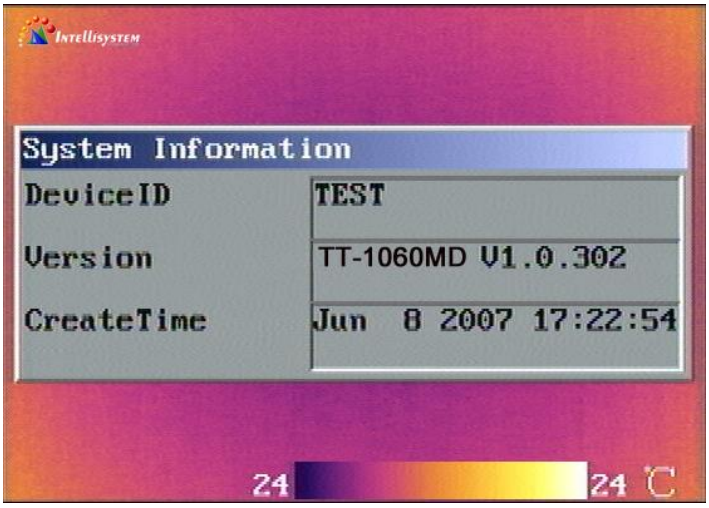


Figure 4.15

This prompt box shows information about Device ID, Software revision, and Camera Create Time etc. No changes can be made.

4.2.3.6 Fact Default

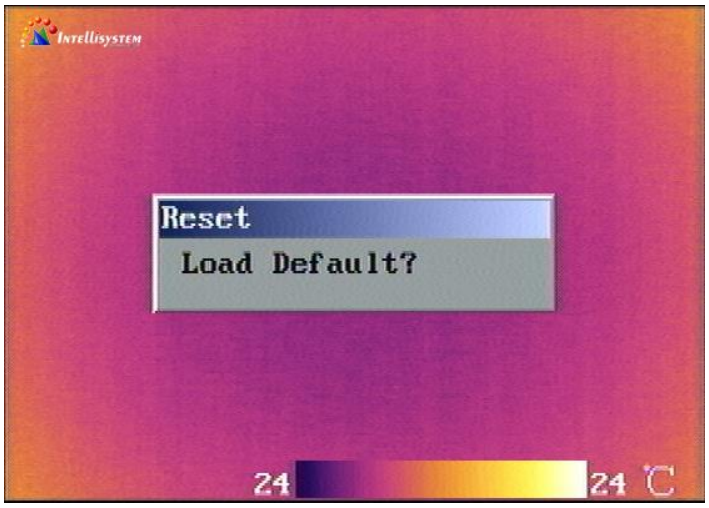


Figure 4.16

- Point to FactDefault and press the confirm button to display the Reset prompt box.
- Press confirm button to reset the camera to the factory settings, press C button to quit the operation.

The Camera will be restarted when you restore factory settings. This will take a few seconds.

4.2.3.7 Network Set

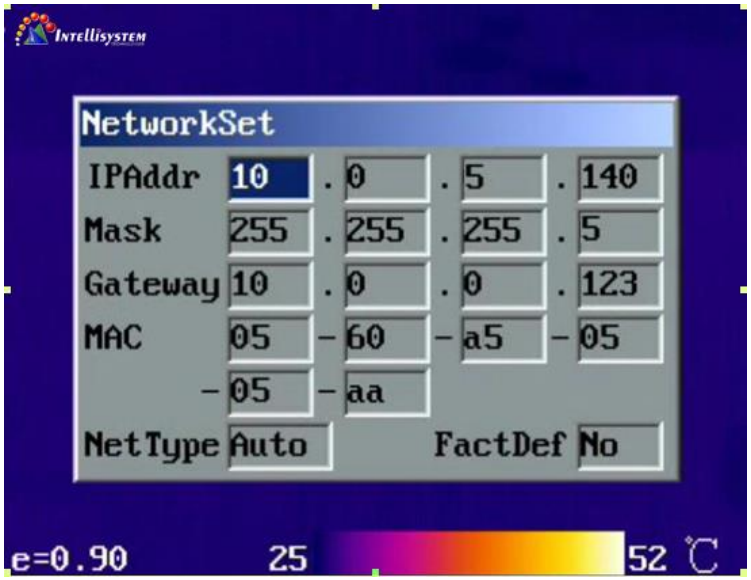


Figure 4.17

Point to NetworkSet and then press the confirm button to display the network setting dialog box. the setting parameter will effective after restore the apparatus.

Label	Value	Comments
Auto	Yes/No	■ Yes: The IP address will be distribute by DHCP services ■ No: Need user set the IP address, Mask, etc.
FactDef	Yes/No	■ Yes: To load the factory default setting ■ No: Need user set the network parameter
IP address		■ To set the IP address
Mask		■ Appoint the Mask by net
Gateway		■ Appoint the Gateway by
MAC		■ To set the apparatus MAC, usually in default. For maintenance reason if you want to change the parameter please contact the manufacture.
Net Type		■ Only adjust this item in the event that the Ethernet work well but the PC can not communicate with the apparatus.

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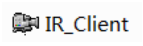
5. Client software operations

TT-1060MD-FTM_Client is accessional software you can use pc to control the camera by this software.

5.1 Getting started

Double click on 

to start up the software, with the interface shown as following:

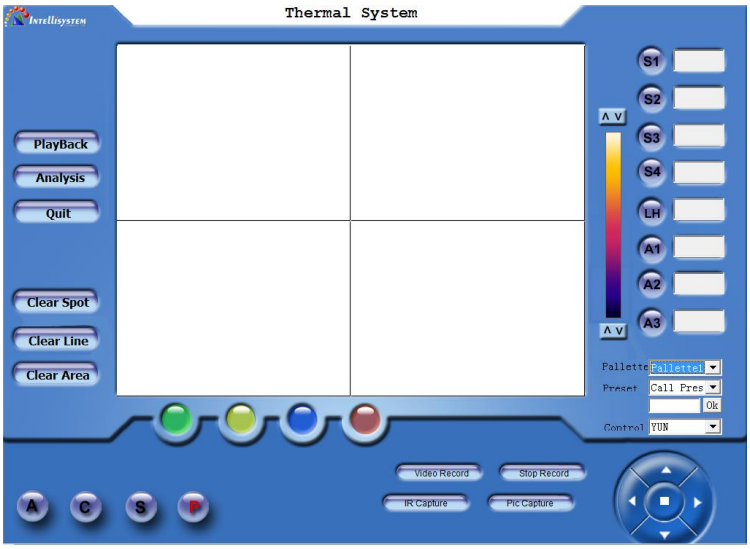


Figure 5.1

5.2 Graphical user interface

5.2.1 Interface and Connection description

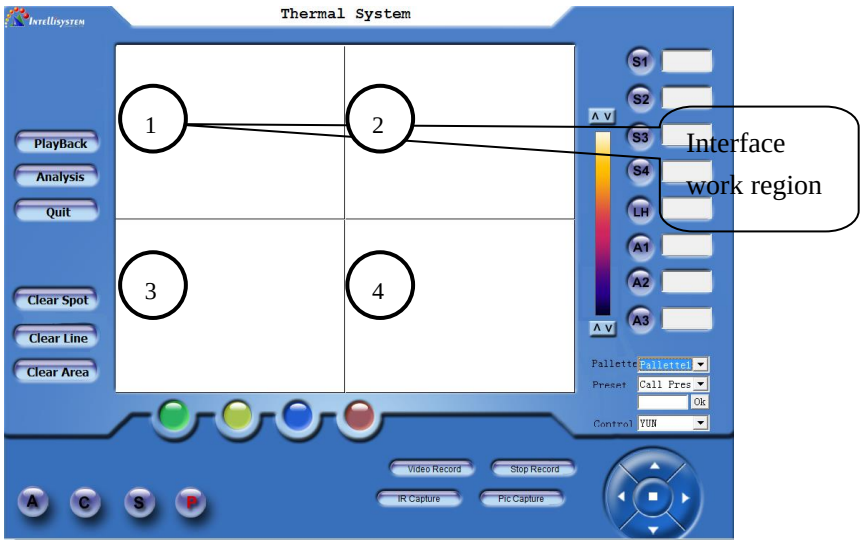


Figure 5.2

There are four small work regions on the software interface, it's said that four apparatus can be connect to the PC and operate by the software, and then operate one of the regions to control the corresponding apparatus.

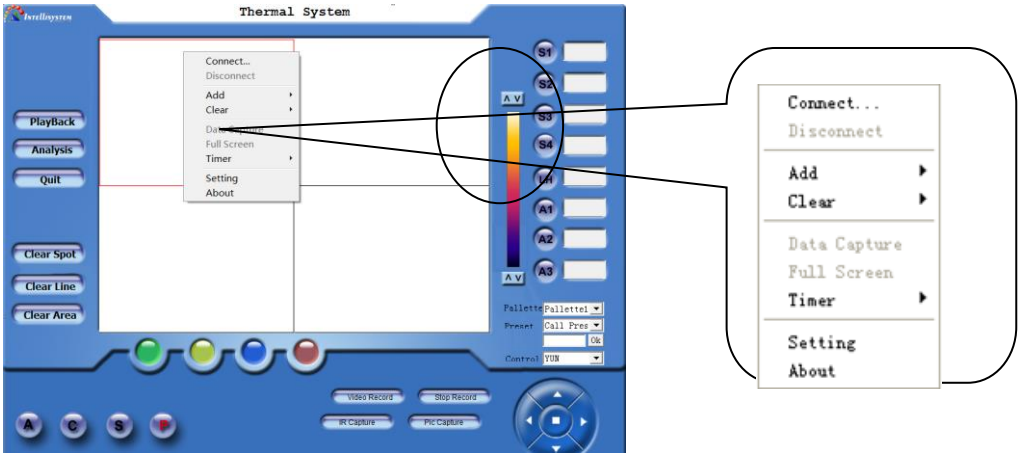


Figure 5.3

- Move the mouse cursor to region 1 and click the mouse to active the region 1, and then click right button to display the pop-out menu.
- Point to the **System** and click to display the system setting dialog box. You can set the ip, alarm, emissivity etc on the dialog box. For more information see the 5.3 system setting.
- Point to Connect on the pop-out menu and click to begin connecting with the PC and apparatus

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Figure 5.4

- If the apparatus in the sleep mode will automatically awaken, the video will display on the screen if the connection is successful.

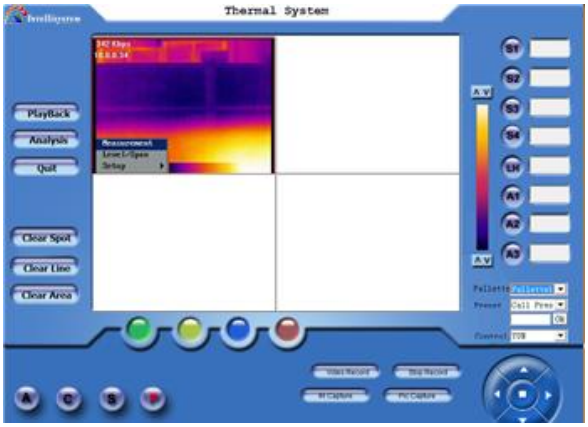


Figure 5.5

- Click the work region 1 to zoom in the region 1 to whole work region.

Figure 5.6

5.2.2 Interface operation description

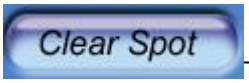
1. PlayBack To start up the video play software. For more information see

section 5.4.

2. 

To analyze thermal image. it's spare function in currently.

Click to quit the software and then the **TT-1060MD-FTM**_Client dialog box will pop-out. (Right figure) Press Y to disconnect the apparatus.

3. 

To clear all spots on the screen. For more information about clear spot see section 21.

4. 

To clear line on the screen. For more information about clear line see section 22.

5. 

To clear all areas on the screen. For more information about clear area see section 23.

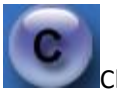
6. 

Click to calibrate the apparatus.

This function is for getting a more accurate measurement and optimal images.

7. 

Freeze the image on the display.

8. 

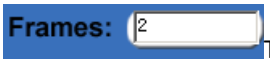
Click to quit the last operation.

9. 

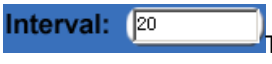
Click to make the apparatus enter sleep mode and disconnect the network connection.

10. 

Click to capture a single frame infrared image. You can also capture infrared by click the "infrared" in pop-out menu to Original Infrared date is saved in single frame rate for your later analysis by using report software.

11. 

To set the frames of the infrared original data record.

12. 

To set the frame capture interval. unit: millisecond (mS), the parameter must be the multiple of 20.otherwise the system will automatic amend the parameter.

13. 

Click to record the infrared data. Every time operation will record

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the frames according with the setting of “Frames”, and the interval of the adjacent frame decided by the setting of “Interval”.

14. 

Click to start recording video. The record will be saved in compressed file. But the monitoring record could not be analyzed by the report software

15. 

Stop the monitoring record.

16. 

Click to capture current image, and the image will be saved in MPEG4 compressed format, but the images could not be analyzed by the report software.

17. 
Simulating keyboard All the function could be operated by controlling this keyboard with keys of A.C.S.P. In menu inactive mode click middle confirm button to autofocus, Click left  and right  key to manual adjust focus.

18. 

To set the color scale. There are nine different palette selections. And the current selected palette will be displayed in the result table

19. 

To Yun terrace position preset. Click ▼to display pull down menu(right figure):

20.

- **Call Preset：** Recall the preset position data.
- **Set Preset：** To set the Yun terrace preset position data.
- **Clear Preset：** To clear the preset data.

21. 

Control item selection. Click ▼ to display options(right figure)：


When you select one of the items the others item will be invalid.

- **YUN：** Select to control Yun terrace；
- **LENS：** Select to control LENS, Click left/right button to adjust focus, or press C button to autofocus.
- **KEYBOARD：** Select to control the camera.The simulate keyboard has different function in different option.

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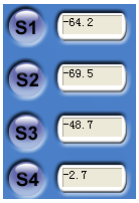
22. 

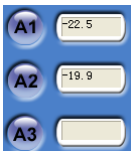
For spot temperature with its temperature value being measured in real-time. While the camera is in the monitoring mode, maximum four spots can be displayed with its temperature being shown respectively. Detailed description is as following:

Example: Press button S2, and move the mouse onto the monitoring frame. Click on its let key on the position you appointed, a spot with No. of 2 will be displayed, with its temperature value being shown in the result table

23. 

Draw the temperature line, displaying the temperature in real-time. Only one line can be drawn while the camera is in the monitoring mode, displaying its temperature of midpoint.

Example: Press LH button and move the mouse onto the monitoring frame. Press the left key of the mouse while moving it until to a certain position and release the key. The start point of the line is where you start moving the mouse and its end point is where you release the key. Its temperature of midpoint will be displayed in the result table.

24. 

Area function, displaying its temperature value in real-time. While the camera is in the monitoring mode, maximum three areas are available, measuring either the maximum or minimum temperature within a rectangular.

Example: Press button A2, and move the mouse onto the monitoring frame. Click on the left key of the mouse while drawing it. A rectangular will be created marked as no. 2. Its highest temperature or the lowest temperature will be indicated in the result table.

25. Click **Add** in pop-out menu can also add temperature measured.

5.3. System setting

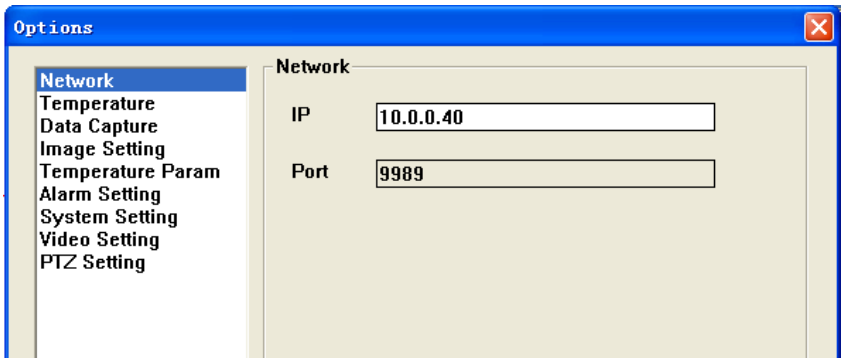


Figure 5.7

IP address: Set IP address of the apparatus.

Note: the IP address setup must same as the current apparatus

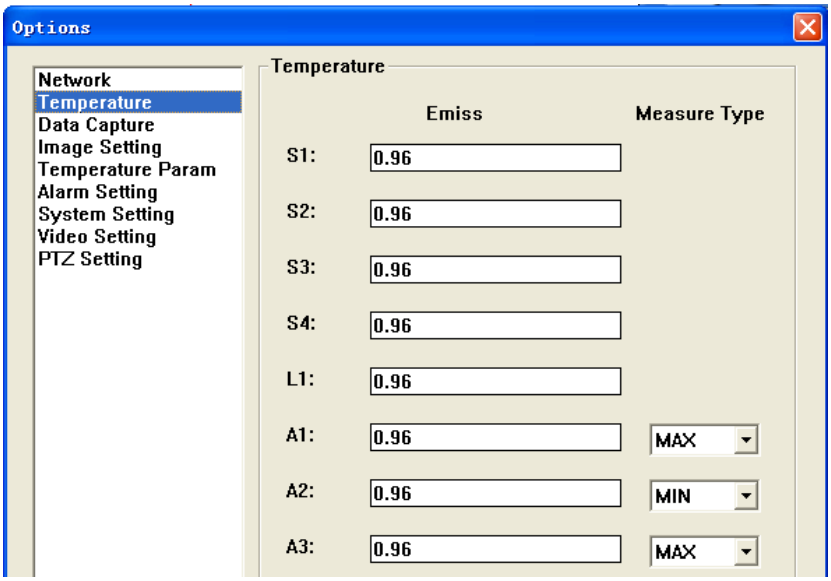


Figure 5.8

To set the emissivity of spots, line and areas .To select the display temperature type of areas.

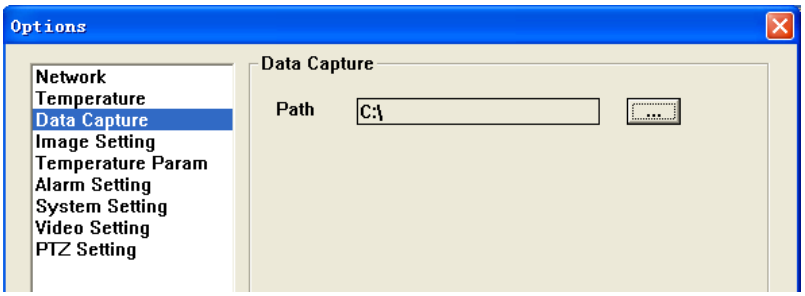


Figure 5.9

Click ... button to change the path.

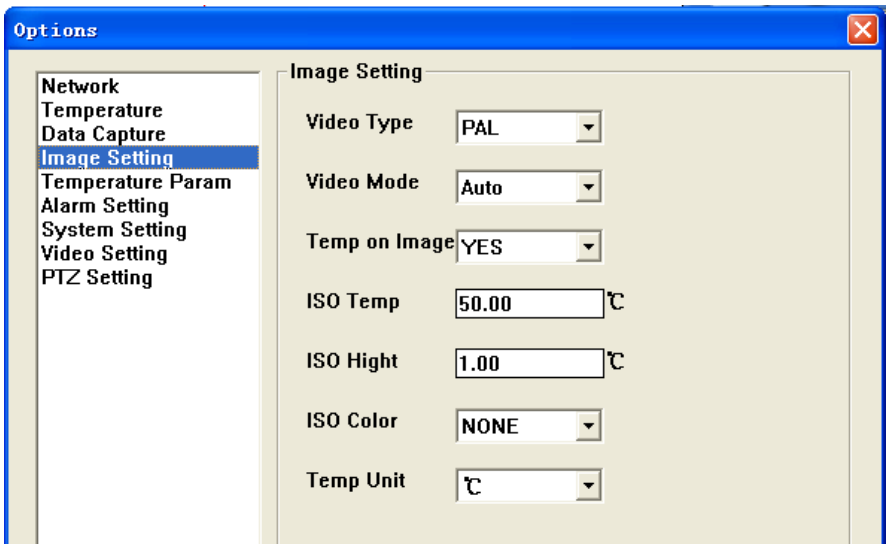


Figure 5.10

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Item	Optional	Comments
Video Type	PAL/NTSC	Analog video output
Video Mode	Auto/Manual	Brightness, contrast adjustment mode
Temp on Image	Yes/No	To show or hide the temperature result and palette.
ISO Temp	User-defined	Isotherm temperature. Reference the 4.2.3.3
ISO Hight	User-defined	Isotherm height Reference the 4.2.3.3
ISO Color	User-defined	Isotherm color. Reference the 4.2.3.3
Temp Unit	℃,F,K	To select the display unit.

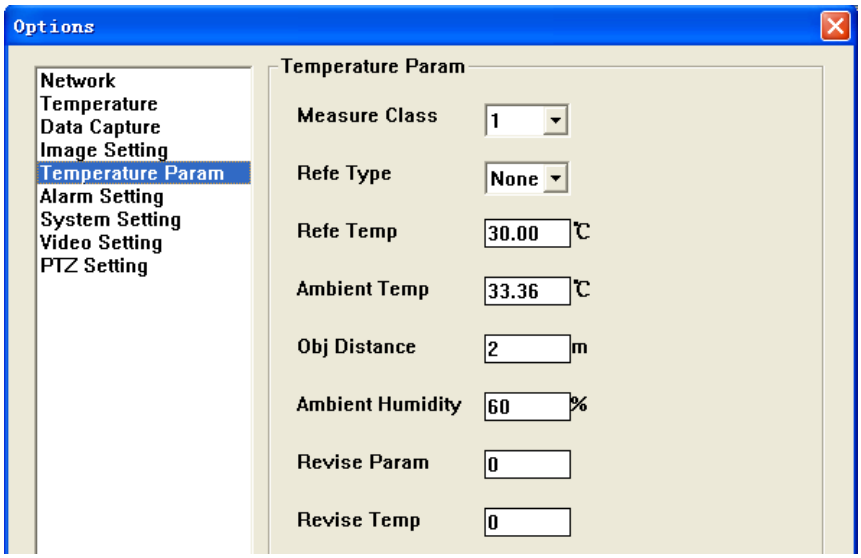


Figure 5.11

Item	Value	Comments
Measure Class	1/2	To select temperature range
Refe Type	9 optional	To select reference temperature type
Refe Temp	User-defined	To set the temperature if the Refe Type selected Value
Ambient Temp	User-defined	To set the ambient temperature
Obj Distance	User-defined	To set the distance from camera to object
Ambient Humidity	User-defined	To set the ambient atmospheric humidity
Revise Param	User-defined	Reference 4.2.3.2
Revise Temp	User-defined	Reference 4.2.3.2

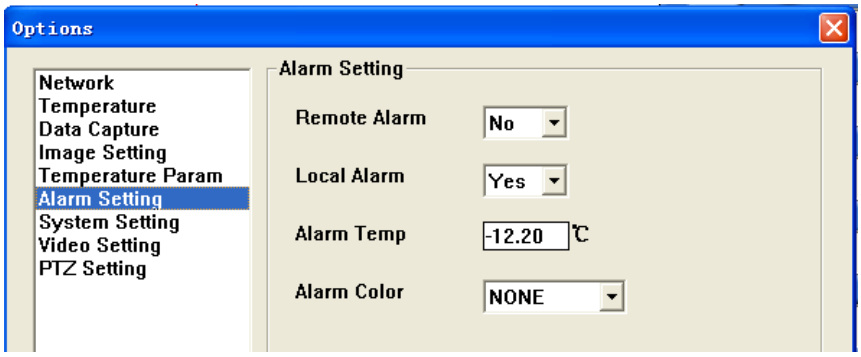


Figure 5.12

Item	Value	Comments
Remote Alarm	Yes/No	Select to active or inactive remote alarm
Local Alarm	Yes/No	Select to active or inactive local alarm
Alarm Temp	User-defined	To set the alarm temperature
Alarm Color	Optional	To select alarm color

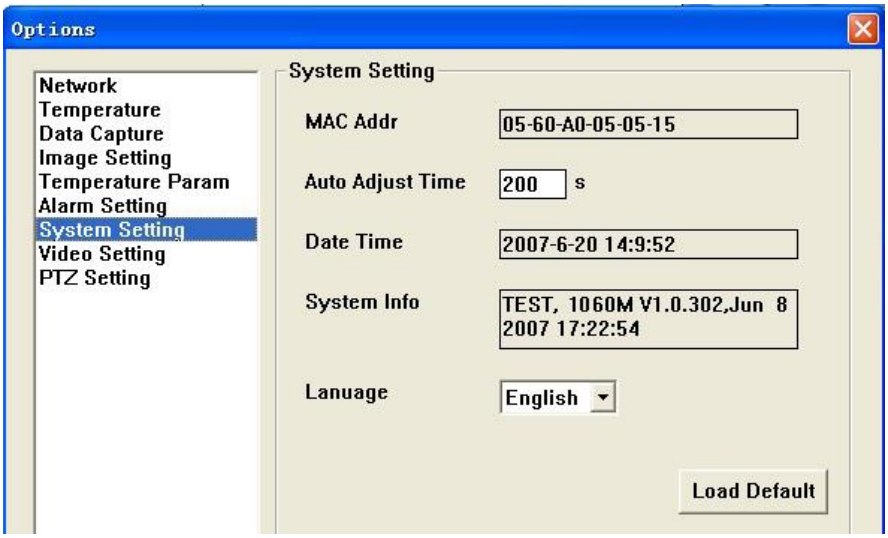


Figure 5.13

Item	Parameter	Comments
MAC Addr	Settled	The unique MAC address of every apparatuses set by manufactory
Auto Adjust Time	User-defined	To set the automatic calibrate time. If set 0 this function will inactive. Range (60~600)
Date Time		To display current date and time
System Info		To display system information
Language	English/Chinese	To select the display language

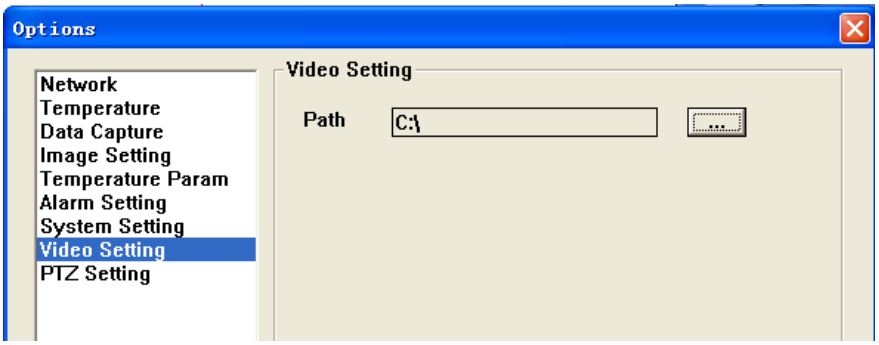


Figure 5.14

Click ... button to change the MEPG4 video saved path.

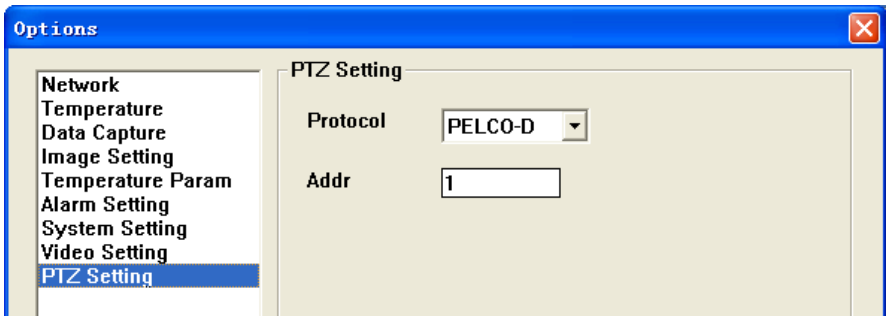


Figure 5.15

- **Protocol**：To select the communication protocol with Yun terrace. Optional: PELCO-D and YAAN
- Addr：Spare address

5.4. Video play software

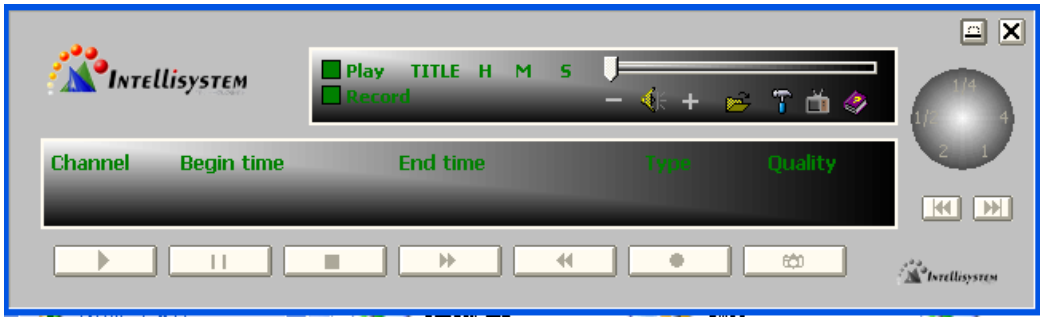


Figure 5.16

- Click  to display a windows dialog box, select the file that you want and then click **open** to play the video.
- Click  to display the following dialog box.

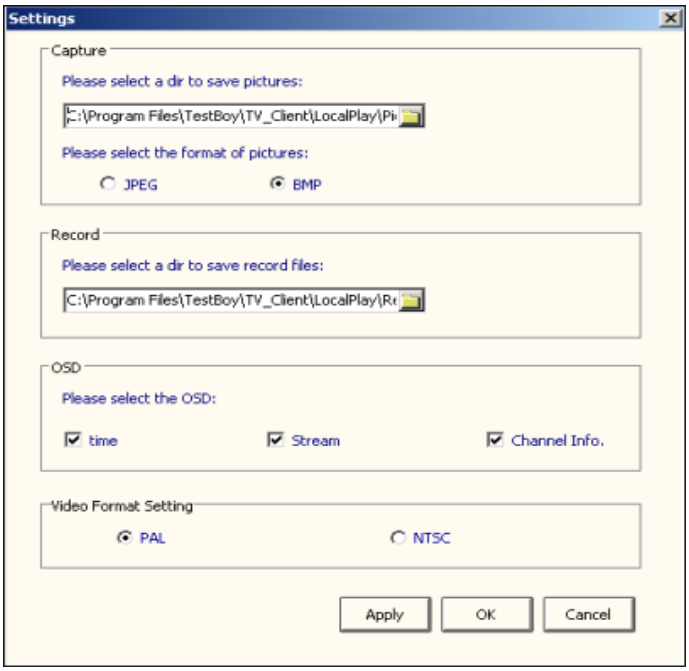
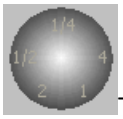


Figure 5.17

- Click  to play the video in full screen.
-  To control the play speed
- 

These buttons are used for controlling video play.

-  To record a section of the video. You can set the save path via operate the setting dialog box.
-  To capture a frame image and save to hard disk. You can set the save path via operate the settings dialog box.

6. Trouble shooting

If you have some trouble like following, please compare with the following contents to ravel out the problem, otherwise please switch off the power supply and contact with the manufactory.

Problem	Problem reason and solution
The PC could not connect with the camera in LAN	One **TT-1060MD-FTM** camera only allow to connect one visitor at a time. Restart the camera and then reconnect the network.
Unable to adjust the focus	The network connection is not successful. Adjust the network and reconnect the camera.
	The electric connector may not be properly connected well. Verify the connection
No image at all	Forgot to remove the lens cover. → Remove the lens cover.
The thermal image turns to black and white	Whether or nor choose the black and white palette Did not calibrate the camera for long time. Calibrate the cameral
After go back default setting, the parameter different with camera and the client software.	It's necessary to reconnect the network, after go back default setting.
Add spots, line or areas by operating with camera buttons, the client software could not display the temperature, position and so on	In order to display the measured parameter you must operate on client software.
The client software could not modify the attribute of object.	The attribute only active after replace the temperature measured object.
The network connection is fail after soon switch on the camera	It will take 8 seconds to complete the self-check after the camera switch on, meantime the camera could not be connected to PC.
The network disconnect abnormal and then reconnect it, but the PC could not connect to camera.	For Ethernet reason, the camera will spend a few seconds to confirm the disconnection of network. Please reconnect the camera after 15 seconds.

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