Thermal Camera Fever screening in public area

Fever detection **Setting guide for Installer**



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Note: Quad channel analyzer is software that analyzes in detail and charts in many forms, so it's very large program. All settings set on the Quad channel analyzer are stored on the software and we do not need to set again next day. In addition, with the setting ZeroOffset, we can display the temperature value read by each pixel in the camera up or down several degrees overall. This is a useful setup because adding 3~4 degrees to the face temperature makes it similar to body temperature.

However, Quad channel analyzer is a program that receives and processes temperature data from up to four cameras, and consequently requires parallel processing which use both CPU and GPU of the PC at the same time, and there is a certain restriction that PC system must be with an i7 level main processor with a separate high specification graphic card. Therefore, we recommend Once channel analyzer which is one channel version of Quad channel analyzer, in case fever screening

configuration is one-to-one connection (one camera is connected to PC (One channel analyzer)). One channel analyzer has the same basic function as the Quad channel analyzer, but is just modified for only one channel connection and dies not require no special specifications for Graphic cards and works well with normal i5 CPU computer.

This camera setup guide for the installer is an excerpt of many of the features of the Quad channel analyzer that are only required for Fever scanning application, and dealer or installer of COX thermal camera must study this guide enough to set before turnover to end user.

Then end user will be able to check for a few simple settings and use them immediately.

So, the installer installs the camera and connects it to a PC on which One channel analyzer is running and set as follows on the One channel analyzer based on camera setup guide for the installer.

- 1) Select Grey color pallet
- 2) Set the default ROI in the polygonal format (afterwards fine-tuned by the end user depending on the location of the installation).
- 3) Set the reference temperature that causes the alarm signal to be output if the measured temperature is higher than the reference temperature in the ROI.
- 4) Set basic conditions of the alarm
 - Setting wave file play and ROI border flashing
 - Settings related to storing thermal image or temperature data when alarm signals are output
 - The setting that causes the One channel analyzer to send an alarm signal to the camera (for which the LED light connected to the alarm output port (#4 & #5) of the camera flashes when the One channel analyzer outputs alarm signal).
- 5) Set Isotherm so that pixels above the set temperature within the ROI are displayed in a specific color (e.g. red).
 - === All pixels below the set temperature are marked by a Grey color pallet and only pixels above the set temperature are displayed in a set color (e.g., red), making it easier to visually recognize what the temperature of the face area is. Also, the longer you look at the monitor, the less tired your eyes are.

Generally, when using a thermal camera at an airport or so for Fever screening purposes,

the color pallet, such as RedGrey, is usually selected and used, but the overall image is so colorful that it is hard to recognize whether the face temperature is higher than other people by looking at the color of the face.

Users can use the fever scanning system immediately based on the settings that the installer has set.

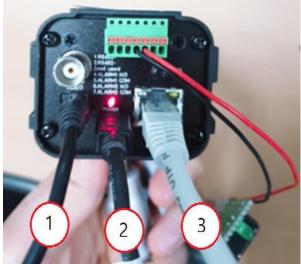
However, it is necessary to adjust the position or shape of the ROI set by the installer to match the actual site of use. In addition, if objects like of lighting on the ceiling or on the wall which is above human face temperature is in the preset ROI, it is necessary to adjust the shape of the ROIs so that they are excluded.

The temperature setting within the ROI should also be simply adjusted to suit the actual use environment.

1. Camera connection



Before connection



After connection

1- AC/DC ADAPTER / 2-mini HDMI / 3- RJ45

(* When the camera is powered on, the LED lights up in the POWER port.

If the camera and the PC are powered on and the RJ45 is connected 1:1 connection, the ETHENET port will be illuminated.

It turns on.)

(X If the ETHENET is not illuminated, replace it with another RJ45.)

2. Quad Channel Analyzer Installation

X For information on installing the Quad Channel Analyzer,

See [QuadChanalyzerSetup]

3. PC - IP Setting

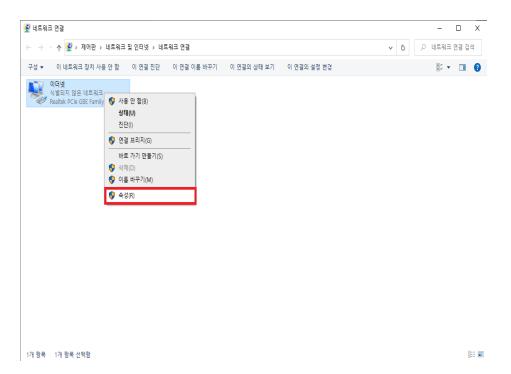
Connect camera to PC using Ethernet cable included in the package (direction connection)

It is set automatically set to (IP: 169.254.100.100, Subnet Mask: 255.255.0.0)

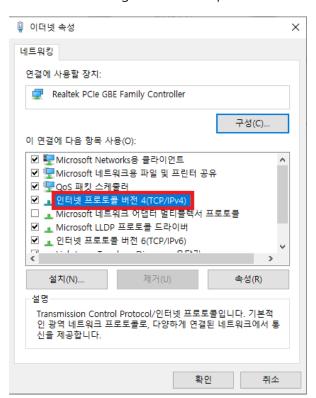
IP setting method



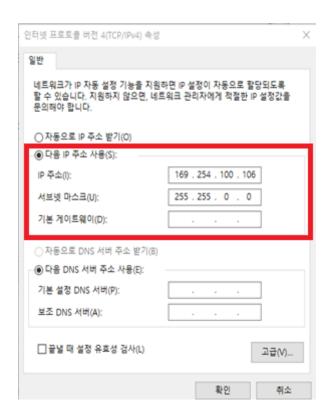
Network → Adaptor option change



Ethernet Mouse Right Click → Properties



Internet Protocol version4 (TCP/IPv4) Double-click

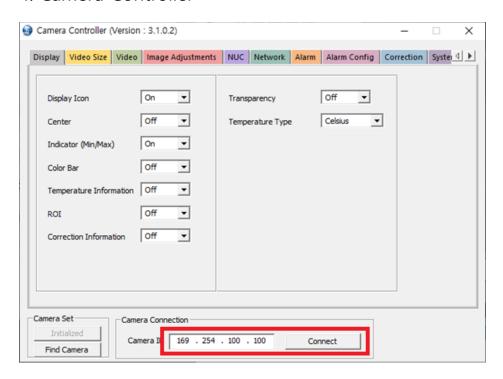


Use the following IP address > IP address: Set to 169.254.100.x

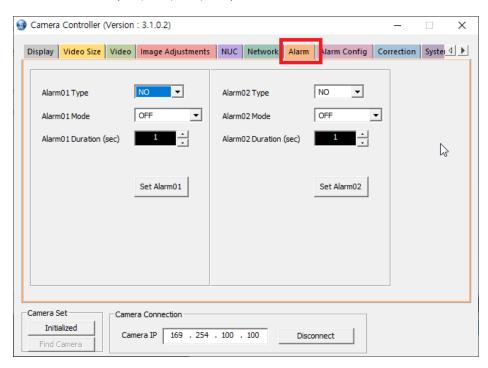
Subnet Mask: 255. 255. 0. 0

(XPlease enter the last digit that does not overlap.)

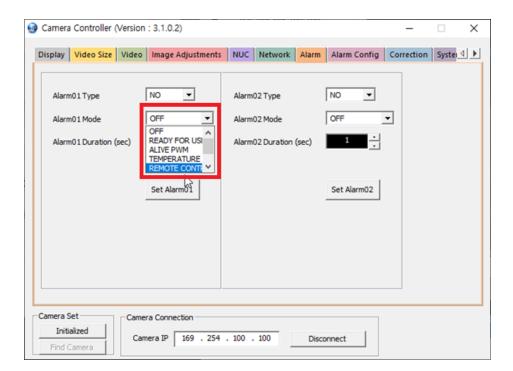
4. Camera Controller



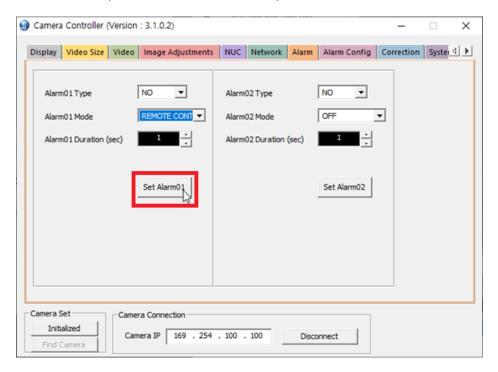
Enter Camera IP (169, 254, 100, 100) and connect.



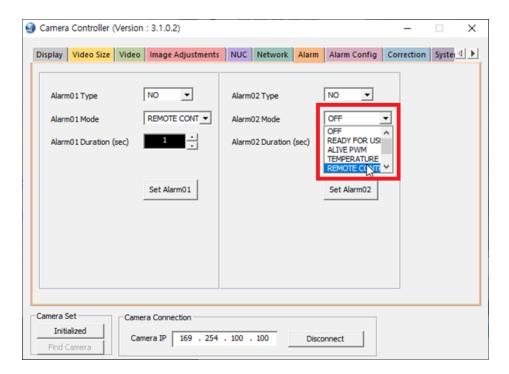
Click Alarm in the top menu



Alarm01Mode (OFF → REMOTE CONTROL)

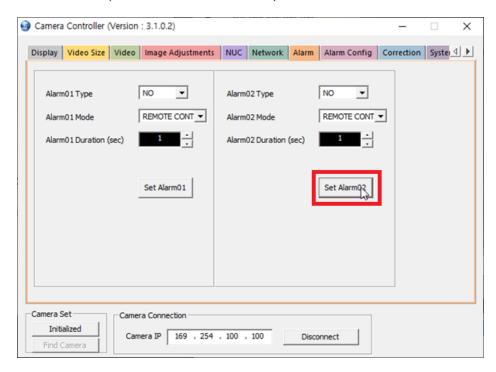


Click Set Alarm01



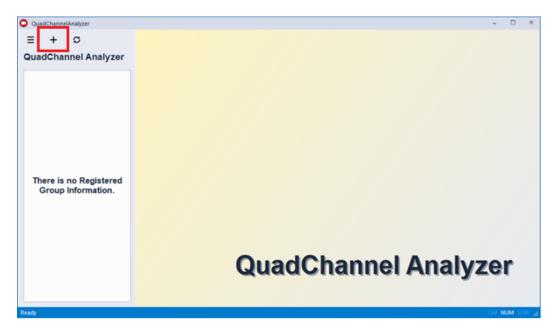
(X When setting Alarm02)

Alarm02Mode (OFF \rightarrow REMOTE CONTROL) as in Alarm01.

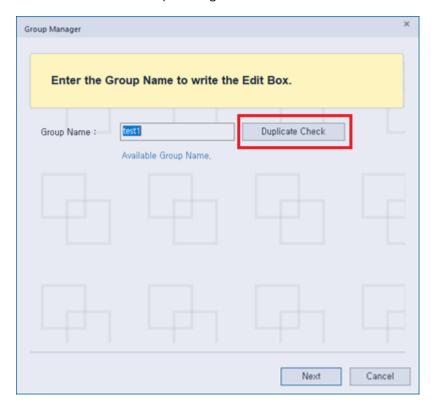


Click Set Alarm02

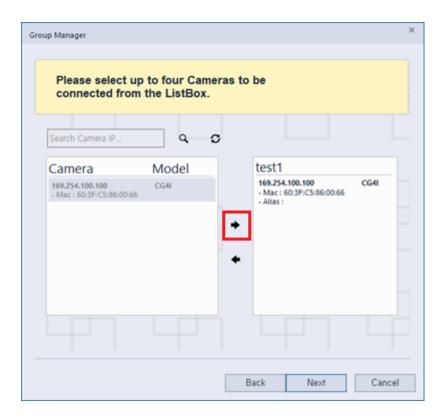
5. QuadChannelAnalyzer Run – Register Group



Click + to create a Group Manager window

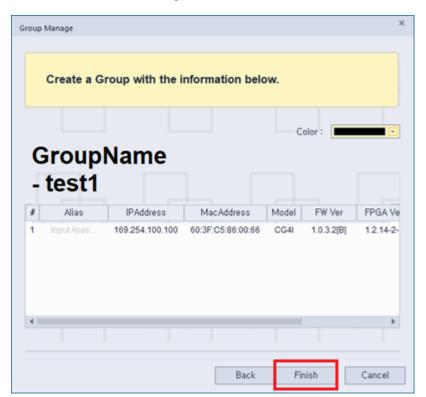


Enter Group Name, check the Duplicate, and then click Next.



Use the list of cameras created in the left ListBox by double-clicking or using the right arrow.

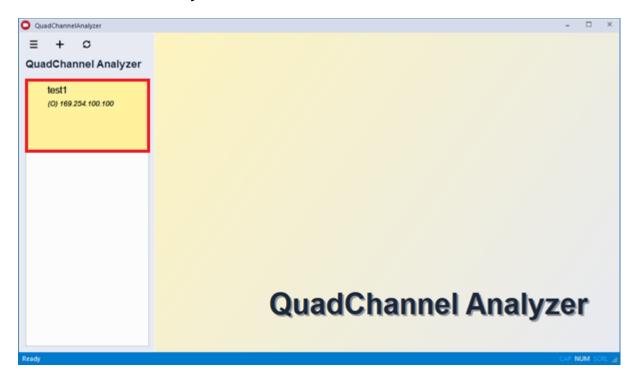
Go to camera list on the right



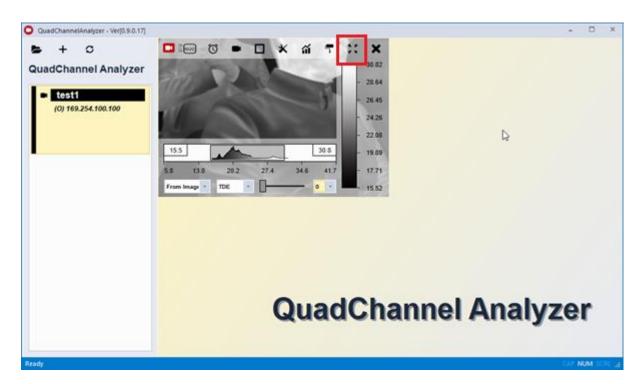
Click Finish to complete group registration

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6. QuadChannelAnalyzer - Connect



Double-click the group on the left to connect.

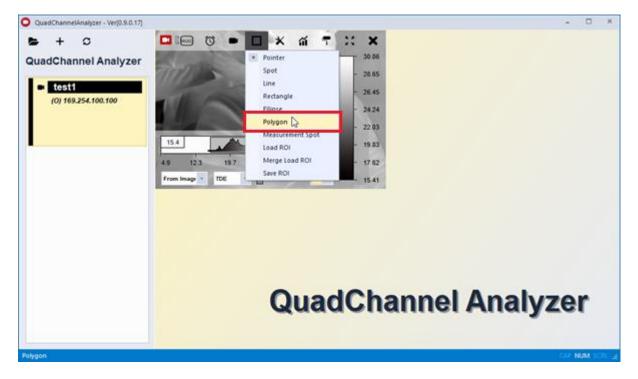


Press the full screen button at the top right of the menu to make the screen larger.

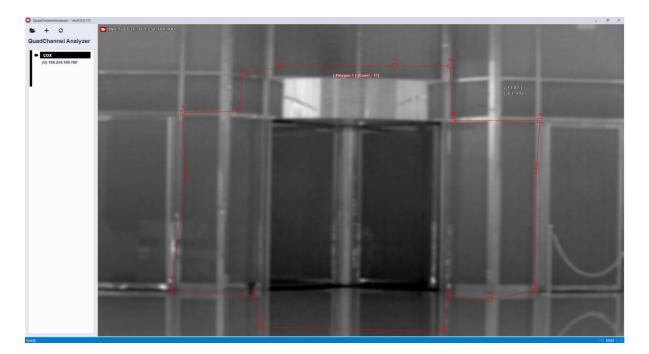
7. QuadChannelAnalyzer - ROI Polygon Setting

Cameras should be installed in front of the people moving, and then the temperature of the face of the people moving should be measured to screen out people with high facial temperatures. To facilitate screening, the portion of the ROI (Region of Interest) should not include objects higher than human face temperatures (e.g., glow lamp on the ceiling or on the wall whose temperatures are always above facial temperature), not to make false alarm.

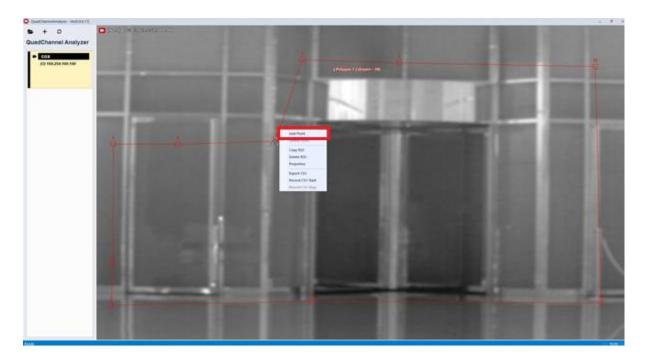
Here, we explain how we set ROI in pattern of polygon.



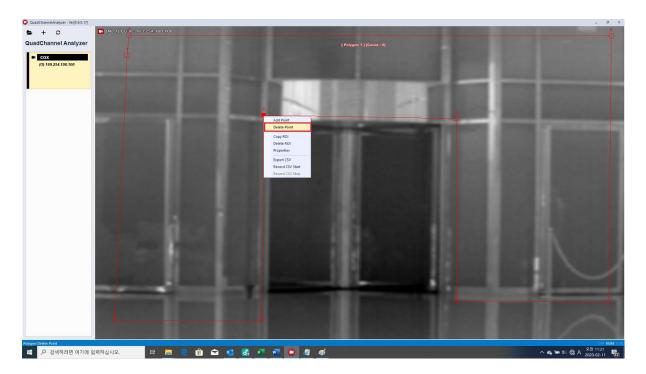
Select Polygon



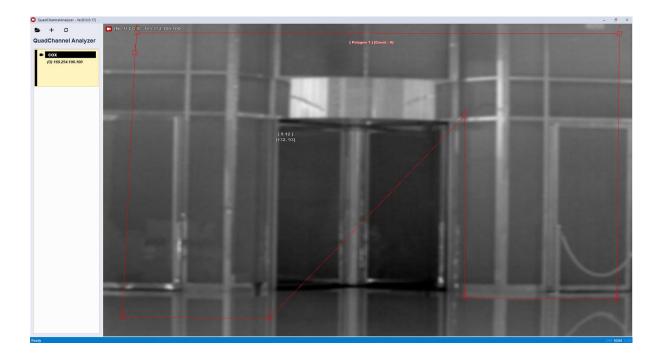
When you left click on the mouse, the point is created, up to 20 points(polygon) in total.

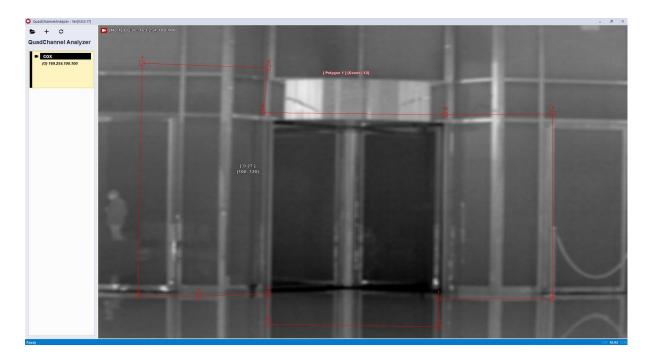


Hover over the Polygon line and right click adds points.

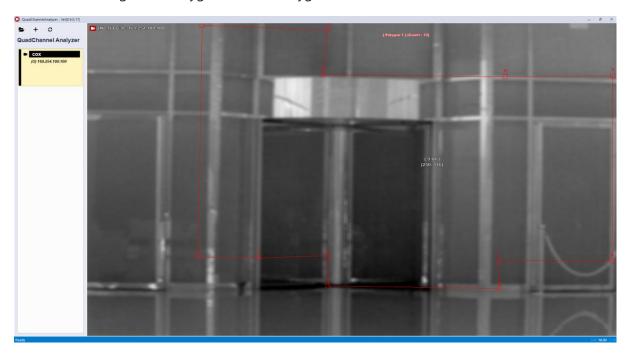


Points will be deleted when you right-click on a Polygon point





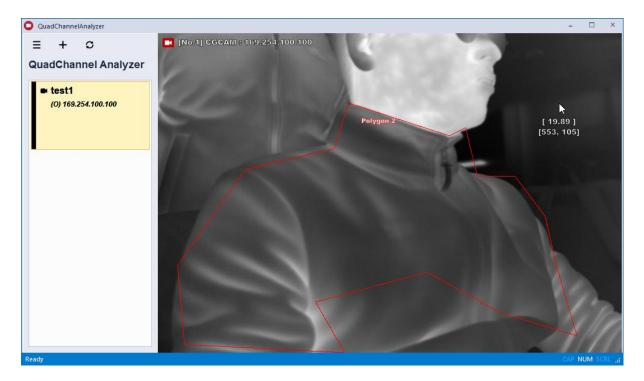
Left click and drag inside Polygon to move Polygon.





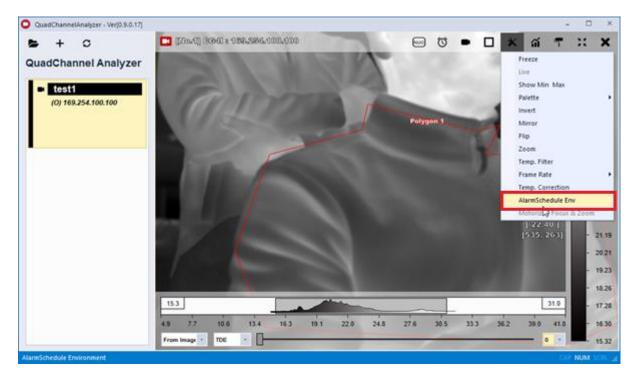
Select the mouse right click, Delete ROI inside Polygon to delete Polygon.



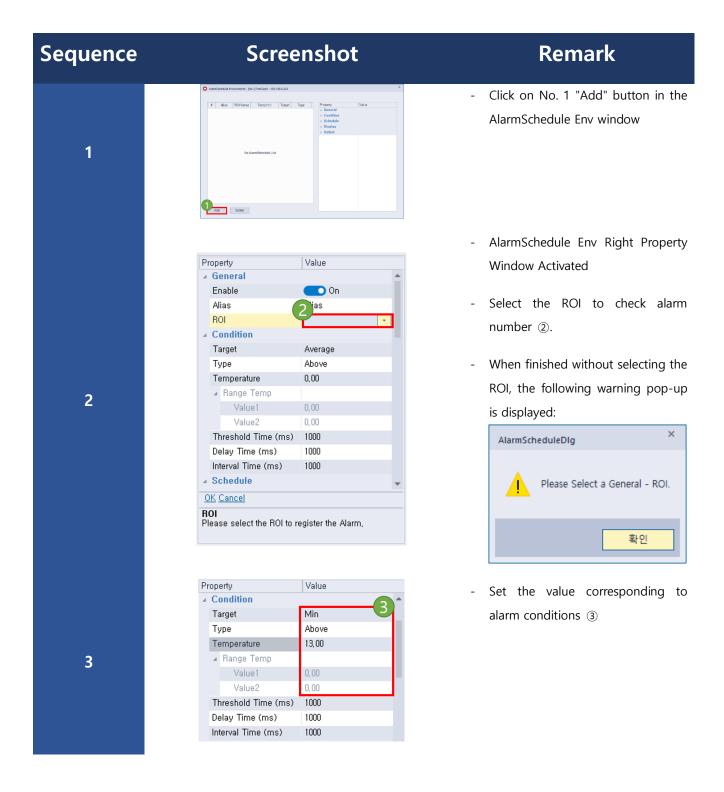


In case any pixels inside ROI exceeds set temperature, alarm signal is issued.

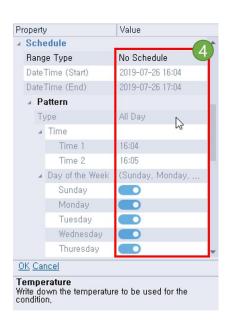
8. AlarmSchedule Setting



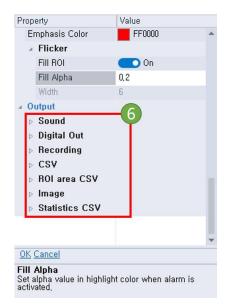
Click AlarmSchedule Env



4 5 6

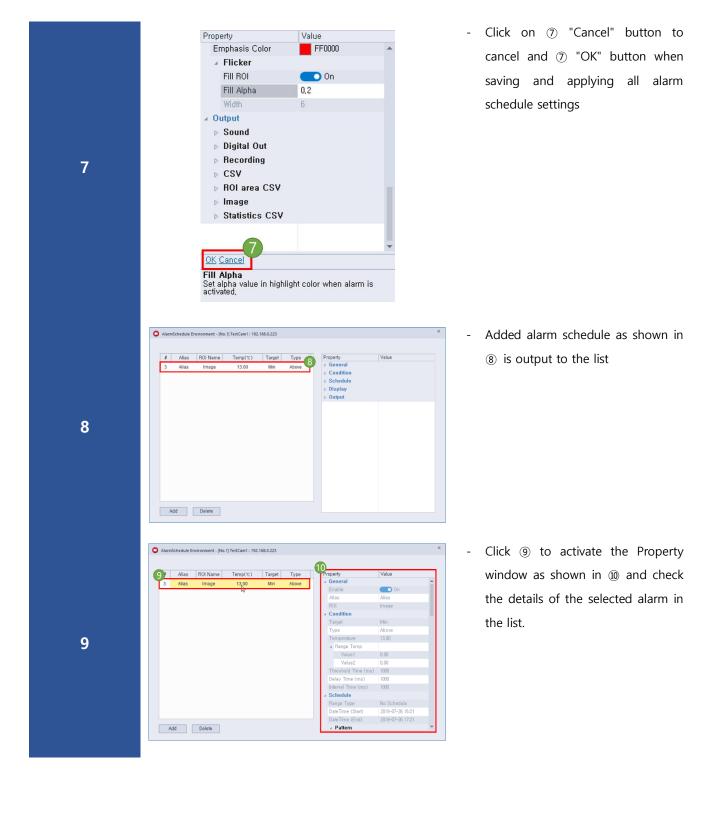






- Set the value for alarm schedule ④

- When alarm No. (§) is triggered, highlight the ROI area on the screen and set the color (pixels exceeded set temperature shall be expressed in set color).
- Set what you want to use in ⑥"Output"



Double-click ① to modify the alarm AlarmSchedule Environment - [No.1] TestCam1 : 192.168.0.223 details in Property 12 Alias ROI Name Temp('c) Target Type Alias Image 10 Task can be completed and canceled with (13) "OK" and "Cancel" Threshold Time (ms) 1000 Delay Time (ms) 1000 Interval Time (ms) 1000 Add Delete Select an alarm in the alarm list and AlarmSchedule Environment - [No.1] TestCam1 : 192.168.0.223 click on the "Delete" button on # Alias ROI Name Temp(*c) Target Type number 14 to output a popup window 13,00 AlarmSchedule 11 Value1 0,00
Value2 0,00
Threshold Time (ms) 1000
Delay Time (ms) 1000
Interval Time (ms) 1000
4 Schedule Are you sure you want to delete the Alarm? Add Delete 예(Y) 아니요(<u>N</u>) Screen where alarm is cancelled. AlarmSchedule Environment - [No.1] TestCam1 : 192.168.0.223 Property

→ General

→ Condition

→ Schedule

→ Display # Alias ROI Name Temp(°C) Target Type ○ Output 12 No AlarmSchedule List. Add Delete

8-1 Alarm Functions Detail

Item	Screenshot	Description
	△ Condition	Average, Min, or Max settingAverage: Conditions to compare with the
Target	Target Average Type Average Temperature Min A Range Temp	average temperature value of the currently selected ROI
larget	Value1 0,00 Value2 0,00 Threshold Time (ms) 1000 Delay Time (ms) 1000 Interval Time (ms) 1000	- Min: Conditions to compare with the lowest temperature value of the currently selected ROI
interval Time (ms) Tuuu		- Max: Conditions to compare with the maximum temperature value of the currently selected ROI
		- Conditions that range according to the temperature conditions set in "Target"
	∡ Condition	- Above : Occurs when the temperature of the ROI is higher than the temperature of the condition
Туре	Target Type Above Temperature ABove Below Value1 Value2 Threshold Time (ms) Average Above Below Between Not Between	- Below : Occurs when the temperature of the ROI falls below the condition temperature
	Delay Time (ms) 1000 Interval Time (ms) 1000	- Between : Occurs when the ROI temperature is within the range of the condition temperature
		- Not Between : Occurs when the ROI temperature is outside the condition temperature range
	✓ Condition Target Average Type Above	- Only active when condition "Type" is Above or Below
Temperature	Temperature 0.00 Range Temp Value1 0.00 Value2 0.00 Threshold Time (ms) 1000 Delay Time (ms) 1000 Interval Time (ms) 1000	- Set the temperature value to generate an alarm

Range Temp - Value1

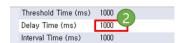
Range Temp
- Value2



Threshold Time(ms)

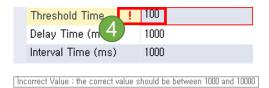


Delay Time(ms)



- Only active when condition "Type" is Between or Not Between
- Set temperature condition to range from Value1 to Value2 when Between
- Set the temperature condition to range from Value1 to Value2 when Not Between.
- Start the alarm after the time set for number

 ① when the alarm conditions are satisfied
- Threshold Time range: 1000(ms) ~ 10000(ms)
- Alert output when setting values are incorrect
 Possible to see warning statements when put mouse cursor on the red exclamation mark as shown on #4

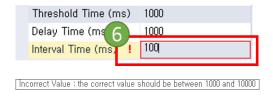


- Alarm is cancelled if the alarm conditions are not satisfied after the alarm is triggered and kept for the time set in number ②
- Delay Time range: 1000(ms) ~ 10000(ms)
- Alert output when setting values are incorrect
 Possible to see warning statements when pit mouse cursor on the red exclamation mark as shown on #(5)





- Prevent alarms from occurring regardless of the conditions of the alarm for the time set in number ③ after the alarm is canceled.
- Interval Time range: 1000(ms) ~ 10000(ms)
- Alert output when setting values are incorrect
 Possible to see warning statements when pit mouse cursor on the red exclamation mark as shown on # ⑥



X This is page 1 of the Add Alarm screen

Threshold Time (ms) 1000

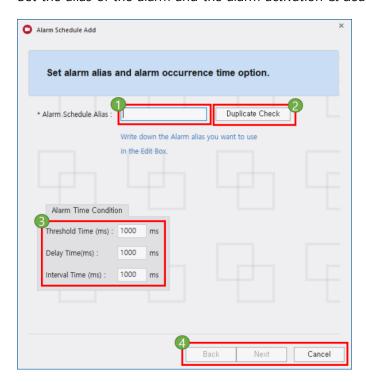
1000

1000

Delay Time (ms)

Interval Time (ms)

Set the alias of the alarm and the alarm activation & deactivation condition time.



< page 1 >

Number	Description	
1	- Set alarm aliases	
2	 Run a check to see if the alarm aliases are duplicated. Check if alarm aliases are duplicated through duplicate inspection "Available Alarm alias": Available "The same Alarm alias already exist.": aliases in use 	
3	"The same Alarm alias already exist.": aliases in use - Set the time at the time of the active & disable switch, depending on the alarm conditions. - Threshold Time: After the alarm condition is satisfied, keep it for this set time and then start the alarm (default: 1000 ms). - Delay Time: If the alarm condition is not satisfied after the alarm is triggered, the alarm is kept for this set time and then the alarm is terminated (default: 1000 ms). - Interval Time: Do not allow new alarm for this setting time after the alarm is terminated (default: 1000ms) - Alarm generation process > - Alarm generation process > - Back: Previous screen	
4	- Back: Previous screen - Next: Next screen - Cancel: Cancellation	

※ "Schedule - Range" option

Item	Screenshot	Description
No Schedule		- Alarm is triggered when alarm conditions are satisfied regardless of schedule
		- Disable all schedule related items
OneTime	ConeTime Schedule Range Type DateTime (Start) DateTime (End) Pattern Type No Schedule One Time Range Recurrence	- Alarm is triggered only the first time
one mile		- Disable all schedule related items
Range		- Set start and end times
		- Enable Pattern item activation.
		 Alarm is triggered according to pattern settings when conditions are satisfied
Recurrence		- Deactivate DateTime (Start)" and "DateTime (End)" items
	Schedule Range Type Range	- Only active when "Range Type" is "Range"
DateTime (Start)	DateTime (Start) 2019-07-26 03:50 • DateTime (End) 4 7월 2019 • 일월 화수목금토 7ype 30 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 종27 28 29 30 31 1 1 5 3 4 5 6 7 8 9 10 10 10 10 10 10 10 10 10 10 10 10 10	- Set the start date time
	▲ Schedule Range Type Range	- Only active when "Range Type" is "Range"
DateTime (End) DateTime (End) DateTime (End) Pattern Type Time Time	Type 일월화수목금토 30 1 2 3 4 5 6 7 8 9 10 11 12 13 Time 1 Time 2 Day of the Week Sunday 12 22 23 24 25 至 27 28 29 30 31 1 上 3 3 4 5 6 7 8 9 10 Today	- Set the end date and time





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Normal screen Item [No.1] TestCam1 : 192.168.0.223 **DrawOn** state Normal screen [No.1] TestCam1 : 192.168.0.223 **DrawOff** state Normal screen No.1] TestCam1 : 192.168.0.223

Normal screen

ROI

Name

Emphasis



Applied screen

- Highlight the ROI area with the color set in "Emphasis Color" as shown in ①.



- DrawOff status is the same as normal screen.



- As in number ②, highlight ROI Name

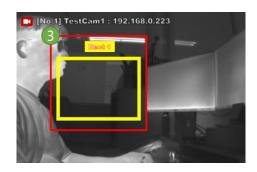


with the color set in "Emphasis Color"

Emphasis Color

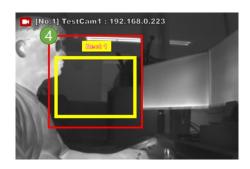


Outputs with set color set

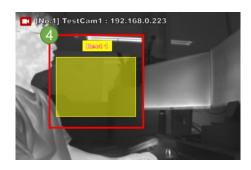


- "Change Emphasis Color" to yellow

Fill ROI



- Fill ROI Off status



Fill ROI On Status

Fill Alpha



- Status with a Fill Alpha value of 0.1.



- Status with a Fill Alpha value of 1.0



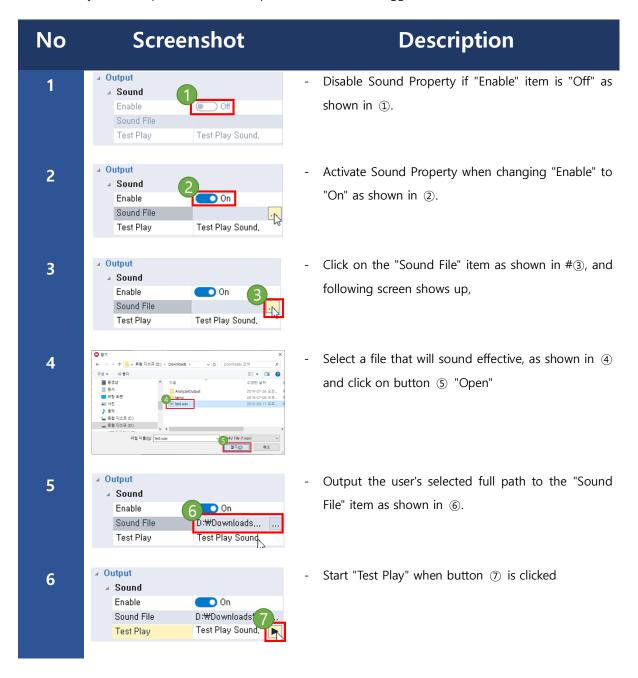


- Width value 1 status



- Width value 10 status

- X Up to two functions can be used at the same time.
- X Play the user-specified file (wav, mp3) when an alarm is triggered.



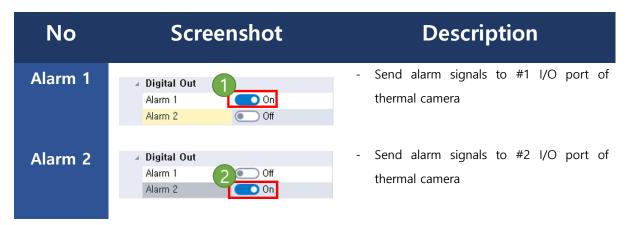


- Stop "Test Play" when button ® is clicked

8-1-2 AlarmSchedule Env – Output – Digital Out

When an alarm is triggered, the alarm signal is sent to the digital I/O port of the thermal camera.

(Quad channel analyzer makes thermal camera output alarm signal when alarm is triggered in Quad channel analyzer to make warning lamp or other device connected to alarm output port of the camera run by alarm signal sent by the Quad channel analyzer)



X You can save various outputs such as CSV, Image, and CRD files when an alarm is triggered.

9. Enable alarm



- Turns the alarm schedule on/off.

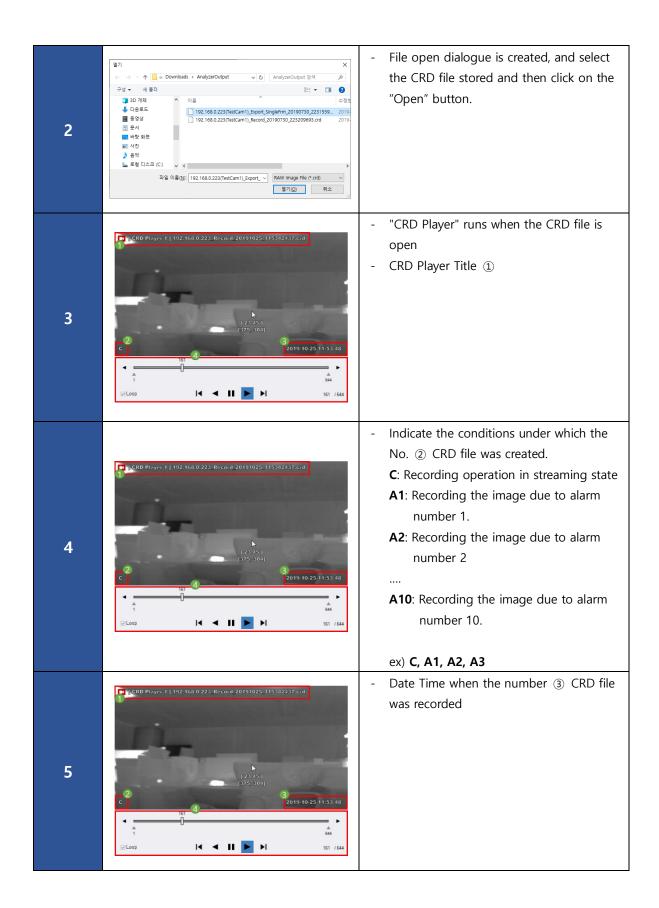
[&]quot;Environment - Output Path" is automatically saved.

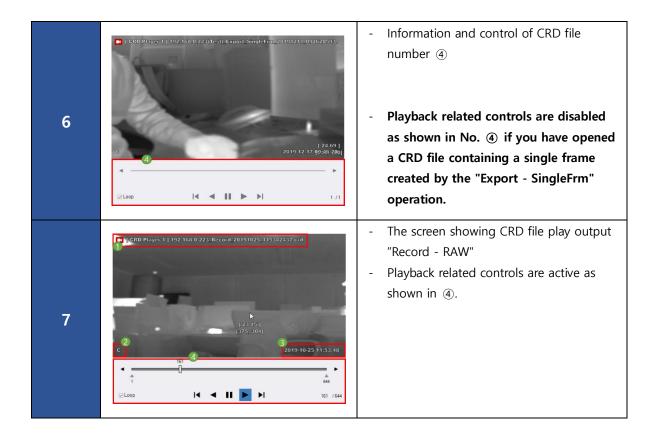


10. CRD Player

- "Export Describes how to play a CRD file created by the SingleFrame", "Record RAW", and "AlarmSchedule Recording RAW" operation.
- CRD stands for Calibration Radiometric Data.
- Up to 4 CRD players can be played at the same time.
- CRD files that are output from the Thermal Imaging Analyzer program are not supported by the Quad Channel Analyzer.

No	Screenshot		Description
1	+ QuadChannel Analyzer	S	- Click on icon ① in main window





9.1 CRD Player - UI explanation

Describes the controls that exist in the CRD Player.



번호	설명	
1	- Show the location of the frame that is currently playing.	
	- Slide bar, which means total frame	
2	- Repeat bar for interval repeat playback on the slider bar	
	- The start and end points of the Repeat bar are located at both ends.	
3	- Button that passes frame by frame forward	
4	- Button that passes frame by frame backward	
5	- whether the replay currently in progress will be automatically replayed from the	

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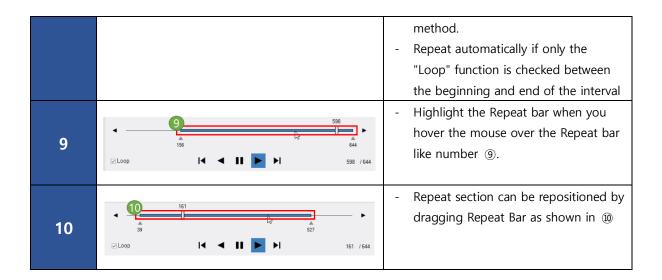
	beginning when the last frame is reached	
6	- Control contents related to play	
7	- The frame sequence of currently play and the total number of frames.	

9.2 CRD Player - 구간반복

- Repeat바를 이용하여 원하는 구간을 반복적으로 재생할 수 있습니다.

No	Screenshot	Description
1	509 1 644 ELoop	- Repeat Bar for interval playback
2	509 	- Arrow in position ② allows the mouse to adjust the starting point of the interval playback
3	502 644 ☑ Loop	- Raising the mouse cursor changes the UI and allows drag to the desired position as shown in ③
4	634 112 ELOOP 14 11 1 634 /644	- Drag and adjust like number ④
5	244 5 120 ELoop 1	- You can check the position of the starting point for interval playback as shown in ⑤
6	236 644 ELoop I ■ 11 ► 1 236 /644	- Hover over an area indicating the position of the interval playback starting point as shown in number ⑥ to output the border
7	282 644 ELOOP I	- Left click of the mouse at the location to display the edit box as shown in No. ② and modify the starting point for interval playback.
8	284 Loop 4	 After correction of the interval playback start point, press the "Enter" key to change the interval playback start point to that position. The end point of interval playback can also be changed using the same

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11. ZeroOffset setting

The temperature of the person's face measured by the thermal camera must be much lower than the actual body temperature.

If you want to read the temperature of the person's face measured by the camera to a temperature similar to the actual body temperature, you can set the ZeroOffset of the One channel analyzer.

The default value is 0 and you can enter a value between -20 and 20 degrees to make the temperature reading by the camera appear uniformly raised or lowered.

If you set to 3, and the camera reads facial temperature is 33°C, 36°Cis displayed.