

Instruction of IR Illuminator

To get excellent performance of the product, please read carefully the following product instruction.

Relation between infrared illuminator and camera lens

The reasons for the importance of the camera lens in relation to the infrared illuminator include the following:

- i. Luminous flux of lens (lumen)
- ii. Angle of the lens and IR illuminator
- iii. Dimension of the chipset

Solution

1. Luminous flux of the lens – to choose the lens with the least F- ratio that has the biggest luminous flux.

2. How to choose the angle of what the appropriate focus is, according to the diagram, to work well with the infrared illuminator –

a. If working with a fixed lens

- i. Measure the distance between the IR camera and object.
- ii. Select the lens with appropriate focus according to the diagram.
- iii. Double check the angle of the lens.

b. If working with a zoom lens

- i. Measure the nearest and farthest point of measurand from the camera.
- ii. Selective focus of the lens.
- iii. Double check the angle range of the lens.
- iv. Choose the IR illuminator which can cover the entire range.

3. Computing the formula for focus of the lens, to display the ratio of the measurand, how to select the dimension of a chipset of 1/3" or larger.

a. Focus of lens for 1/3" inch chipset:

1. $F = 4.8 \times L/W$
2. $F = 3.6 \times L/H$

b. Focus of the lens for 1/2" inch chipset:

1. $F = 6.4 \times L/W$
2. $F = 4.8 \times L/H$

4. For example: 50 m away from the camera there is a man, 1.7 m tall, which occupies 1/4 height on the screen. $F = 3.6 \times 15m / 1.7m \times 1/4 = 8 \text{ mm}$; where F = Focus, L = Distance between lens and measurand; H = height of the measurand; W = weight of measurand.

i. The computing formula is based on the measurand range filling the entire screen. If it fills only 1/4 of the screen, multiply the focus by 1/4.

ii. Depending upon a reasonable price and cost, the angle range of one infrared illuminator may not cover the expected range of the zoom camera. The edge of the screen will be gloomy or fuzzy. The solution is to combine IR illuminators with small angles or using different illuminating distances - together with technical expertise.

Selection of camera

The camera should have day and night, color and black-and-white functions, or infrared (IR) function, and should be sensitive to 850nm infrared [IR] light. The dimension of the chipset should be up to 1/3 inch and below 0.01 Lux. If using a regular colour camera, the IR filter should be replaced with one that is penetrable to 850nm IR light. If you only remove the IR filter without replacing it, metachromatism will occur.

Matters that need attention

1. Adjustment of the Auto Iris Lens. The auto iris lens has DC and video drive modes. Adjust the ALC (automatic level control) to fit the IR illuminator exactly; otherwise the illuminative distance will be markedly affected.
2. The deviation angle of the mounting should be accurate within 2° (in relation to the plane of the camera).
3. Operating temperature should be between -20° C and 50° C.
4. Optimum Distance. Halfway between the illuminate distance and the IR illuminator is the optimum distance. (Test by 1/3 CCD, 0.01 Lux camera).
5. Voltage. Use according to the voltage rating of every product.
6. Debugging. IR illuminators need to debug before they are used, which, in relation to the camera and other equipment, may need technical assistance from a qualified technician.

Infrared illuminator angle

Optimum distance in relation to the focus and angle of the camera lens, based on a person (1.7 m tall) occupying 1/4 height of the screen.

Focus (mm)	Relative Aperture	Close-up Distance (m)	Dimension of Chipset	Horizontal Viewing Angle	Optimum Distance (m)
75~80	F/1.8	0.2	1/3"	4°	150m
60~75	F/1.8	0.2	1/3"	4° ~ 5°	120m
50~55	F/1.8	0.2	1/3"	5°	100m
40~45	F/1.8	0.2	1/3"	6°	80m
35~40	F/1.7	0.2	1/3"	7°	70m
30~35	F/1.7	0.2	1/3"	12°	60m
25~30	F/1.4	0.2	1/3"	12°	50m
20~25	F/1.4	0.2	1/3"	14°	40m
16~20	F/1.4	0.2	1/3"	17°	30m
12	F/1.4	0.2	1/3"	33°	25m
8	F/1.4	0.2	1/3"	22°	20m
6	F/1.2	0.2	1/3"	51°	10m
4	F/1.2	0.2	1/3"	76°	8m

»» Schematic plot of the angle of IR Illuminator

