

## Important tips

### of use laser intelligent IR high speed dome camera

When adjusting or testing, please don't look straightly at the flares from the laser launch hole within 0.5m.

Don't put explosible goods on the beam path from the laser launch hole within 0.5m, in order to avoid damage and hurt.

Please keep distance at least 0.5m from the laser launch hole when you use this camera.



1. When adjusting and testing it, if you want to know whether the laser is output. The simple operation is: use a white paper to block the place away from laser launch hole for 10cm, if there are red spots appears on the paper, means the laser is output; if without the red spots, means the laser isn't output.
2. The wave length of laser output by the laser illuminator is 810nm.
3. "**LASER WARNING**" mark is same as this picture, please don't break off it.
4. If you need to dismantle the camera to repair it, please don't use your hands to touch the welding joint point, that will lead static electricity into the camera to break through the laser launcher.



#### Security description:

1. Theoretical description of security

1) Laser have 4 features: high brightness, high directivity, high single color, high coherence.

**High brightness:** high irradiation intensity, the power on the unit area of irradiation area is very high.

**High directivity:** good parallelism degree of laser light output, easy to meet the milli-radians magnitude.

**High single color:** the light width of spectrum is narrow, the wave length of laser light have a good singularity.

**High coherence:** the high single color and high regularity of the phase forming the high coherence, easy to form the intervene stripes.

Within these 4 features, "high brightness" and "high directivity" are easy to cause the dangerous hurt. "High brightness" ----- the power on the unit area of irradiation area is very high, it even can cut metal. "High directivity"-----the angle of laser light is very small, and have good parallelism degree, so it is easy to form many small spots, to enlarge the power in unit area, will cause hurt.

#### Some common harmful situations in our life:

- ◇ Look at the laser with eyes in a short distance, the laser light can gather together to people's retina, and collect all energy to form a very small spot in a small unit area, then make the total power enlarge more than 100,000 times. So **look at the laser in a short distance is very very dangerous.**
- ◇ Laser shine on the dynamite, oil or similar objects, cause the explosion.
- ◇ Laser shine on the paper, cloth or other inflammable, cause the fire disaster.
- ◇ Laser shine on the skin, cause the skin burns.

2) Laser illuminator is in order to add a IR light source for the camera's night vision function, it need to shine on a big area, so the light output angle is big, not easy to gather together. This means the **"high brightness" and "high directivity" are destroyed.**

3) Compared with the sun irradiance strength:

Definition of irradiance strength: when the light through the cross section, the power of light on the unit area is it. The irradiance strength= power / area. When the output power of laser illuminator is 1.6 W, the light angle is 10°, then at the place with 1m distance, the irradiance strength is 67W/m<sup>2</sup>.

At the tropic and desert zone, the irradiance strength of sun is 210~250W/m<sup>2</sup>; at the temperate zone, the irradiance strength is 130~210W/m<sup>2</sup>.

**So, after this contrast, the laser illuminator is under the normal operation (hanging a certain height), is absolutely safe.**