

Application Note – Advantages of Pulsing

Gardasoft Vision's controllers generally have two modes of operation – pulsed or continuous output.

Continuous Mode

Continuous output is where the lighting is on all the time. This is the easiest mode to use as the intensity of the lighting is the only parameter that needs to be set.

Pulsed (or Strobe) Mode

In pulsed mode the lighting is only on when required. The controller receives a trigger signal when a pulse is required. The delay from the trigger to the output pulse, the length of the pulse and the intensity of the pulse are all configurable.

By using pulsing, it is possible to freeze the image of moving objects. Gardasoft's controllers have fine adjustment of the pulse timing, which is often more flexible than the camera timing. The camera can be set for a longer exposure time and the light pulsed on only for a short time to freeze the motion.

Because the lighting is on for a shorter time, its lifetime is longer. Ageing of LEDs is proportional to the amount of time that they are on.

When LEDs are pulsed, they can be "overdriven" which can give much brighter intensity for short periods. The output current can be set much higher than the rating for the light. Care must be taken to ensure that the pulse length is not too long and the duty cycle not too high. For example, on our PP900 controller we apply the following limits on overdriving, which we believe are very safe.

Overdriving – how many times greater than the rated current	Allowed Pulse Width	Allowed Duty Cycle
0.00 to 1.00	99ms	100%
1.01 to 2.00	30ms	30%
2.01 to 3.00	10ms	20%
3.01 to 4.00	1ms	10%
4.01 to 5.00	0.5ms	5%

Some machine vision engineers use up to 10 times overdriving. The graph on the right shows how the light output increases for one particular LED when overdriven. At an overdrive factor of 1 (rated current), the light output is 1 (the rated light output). As the LED is overdriven with up to 7 times its rated current, the light output increases by a factor of 3.2, giving much greater brightness.

See also APP911 – How To Use Pulse Mode.

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