Ophir-Spiricon Inc.

Bulletin # __BUL-0030_____ Rev: _A_

Issued by: _Jed Simmons_____ Date: _3/21/2016___ ECO#_23429___

Engineering Bulletin

BeamWatch units showing large beam widths at high peak intensity

Scope:

This bulletin relates to BeamWatch when the width results are inflated due to premature saturation in the imager.
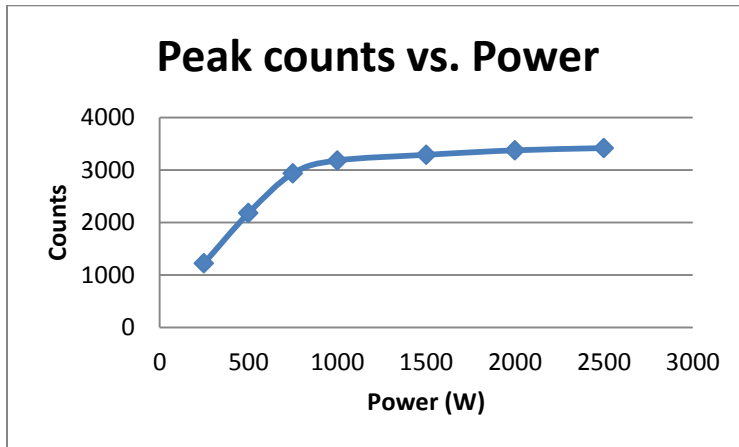
Objective:

Provide detailed information about and a solution to the problem for users. This solution is intended to allow users to get around the issue until a software release can be made to correct the issue.

The Problem:

The imager is saturating prior to reaching its full dynamic range and so it is not immediately clear to the user that saturation is occurring. As the imager saturates the measured waist width increases far above expected values. The problem is evident when observing the peak value in the image while increasing the exposure from a low value of 250 ms to a high value of 2000 ms. The images below show examples of acceptable (left) and unacceptable (right) peak levels.
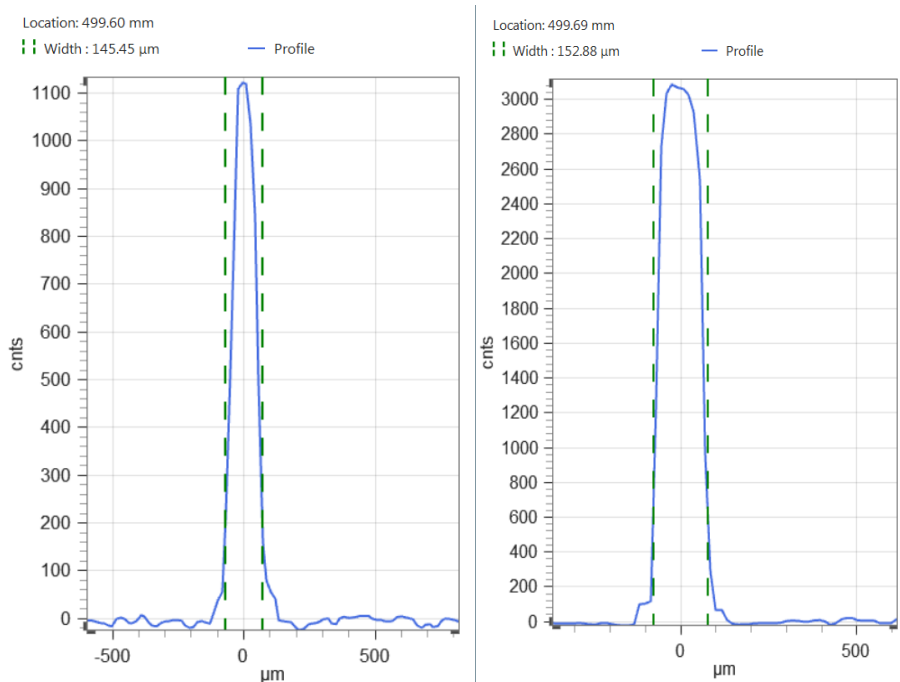
Though the peak value may increase linearly with exposure time eventually there is an apparent roll off in the peak value which is indicative of saturation. This is illustrated in the figure below when the camera is set to 2 second exposure time and gain 1 dB .

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Peak counts vs. Power

The Solution:

It was found in the tests performed that keeping the peak number of counts to less than 3000 keeps the camera in a range where it behaves approximately linearly and avoids the problem of roll off. This was found for an exposure time of 2 seconds. It was found that with an exposure of 1 s the roll off appears to move higher, so the 2 second exposure time is expected to be the worst case scenario. The peak may be kept down by keeping the exposure low or keeping the laser power low.

Another solution is to keep the imager gain above approximately 4 dB. This is expected to effectively push the roll-off region above the maximum pixel value.

Distribution:

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