

## **6-Channel Laser Merge Module with Dual Laser Output**

### ***Introduction***

Visitech Internationals 6-Channel laser merge module can combine up to 6 solid state lasers into a single or double fibre output.

The configuration in Appendix A (figure 1) shows the six most common laser lines; 405nm/50mW, 442nm/40mW, 488nm/50mW, 514nm/50mW, 561nm/50mW and 642nm/50mW. However any solid state laser can be incorporated into the design.

### ***Design***

All six solid state lasers have there on/off state controlled via software through the control unit and all lines are fired directly into the “Beam Combining Optics”. The beam combining optics consists of a set of dichroics specified to match the lasers being used to ensure optimum beam combination and output. There is also a series of positioning mirrors used to ensure that each beam is launched into the AOTF at the optimal height and position. The net result of these optics is to combine each of the integrated laser lines into one beam which is then launched into the AOTF. All systems are manufactured with the standard beam combining optical components in place so in the field upgrades can be performed.

The AOTF is then used to control laser line selection and laser line intensity via software control through the control unit. The AOTF offers extremely fast switching of laser line intensity and 0-100% intensity control.

Light out of the AOTF then enters the optional “Beam Splitter Optics” unit. This unit allows the user to control (via software and through the control unit) the output of the laser lines into two different fibres as desired. This allows the user to use a single laser merge module unit for two different imaging techniques, for example confocal imaging and TIRF.

### ***Dual Laser Output***

The dual laser output configuration allows the user to choose between two output fibres via software control.

Under standard operation all lines are output from a single fibre which is then passed to the required equipment such as a confocal scan head.

Via software control a mirror can be positioned into the beam path to re-direct all lines out of a second fibre which can then be used on a different piece of equipment such as a TIRF system.

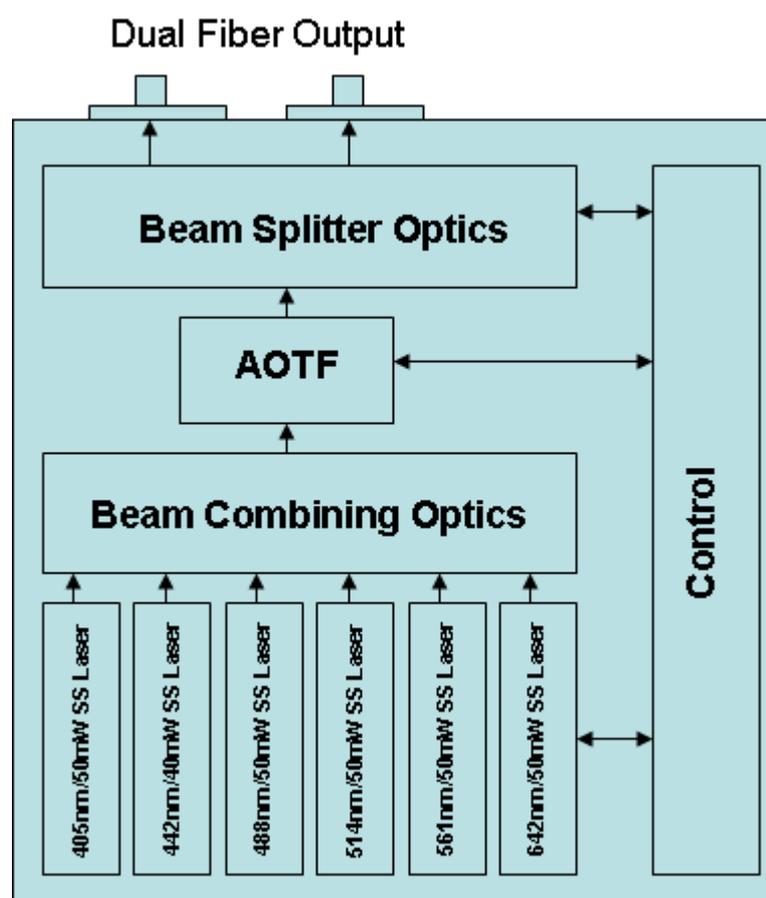
Switching speeds of <500mS between the two outputs can be achieved.

### Summary

Visitech Internationals 6-Channel Laser Merge Module can provide illumination solutions for a variety of imaging techniques. Visitech Internationals beam splitter optics also allow the user to control via software the output of the beam between two different fibres.

Visitech Internationals block design allows easy in the field upgrades providing the user full flexibility for future applications.

### Appendix A



**Figure 1:** Visitech Internationals Standard 6-Channel Laser Merge Module design.