

Ultra 50 Laser

Quantel Laser

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1 General Safety Information

- The Ultra 50 is capable of a maximum output of 30 mJ at 532 nm, with a pulse duration of 7 ns, has been classified as Class 4 and thus is capable of causing serious eye damage from direct or indirect viewing of the beam and may present a risk of causing tissue damage or igniting flammable materials if exposed to the beam.
- Whenever viewing of the beam is possible, safety eyewear with a minimum optical density of 5.591 @ 532 nm must be worn.
- The Ultra 50 has very low beam divergence, so the intrabeam nominal hazard distance exceeds 4,000 m and it is thus critical that the beam does not leave the confines of the curtained section of LM630.
- The Ultra 50 has a diffuse nominal hazard distance of 2.2 m, and it is thus essential that protective eyewear remain on even when not directly viewing the beam, when firing at full power.
- The Ultra 50 is a frequency-doubled 1064 nm laser—if the left output port is opened, a <50 mJ 1064 nm beam will be emitted that is not visible to the human eye.
- Per University of Toronto regulations, all users of Class 3B and Class 4 lasers must have completed the university laser safety training course.

2 Standard Operating Procedure

1. Ensure curtain is closed and “Laser in Use” indicator is active.
2. Don protective eyewear and ensure reflective personal items (watches, etc.) are removed or covered.
3. Ensure the port selector on the front of the laser is covering the left output port and that the beam path between the laser and microscope is clear.
4. Insert interlock key into power unit and turn to start coolant pump. After this point, assume that light could be emitted from the laser at any time.
5. Set desired settings using the computer or wired controller and proceed with your experiment, ensuring that the output block is disengaged (the silver rotary lever on the side of the laser should be parallel to the direction of the output to allow light to exit.).
6. When completed, engage the output block (the lever should be perpendicular to the beam at the output) and remove the interlock key to deactivate the laser. After this point, laser emission is not possible.
7. Remove protective eyewear, store the interlock key safely away from the laser, retract the curtain, and ensure the “Laser in Use” indicator is off.

3 Alignment Procedure

1. Follow the Standard Operating Procedure to make the laser ready for an experiment.
2. Set the attenuator to 0.5% to reduce the risk in case of accidental beam viewing or exposure.
3. Set the microscope turret to the open port and move the condenser head back to allow the beam to exit from the top of the microscope.
4. Set the microscope filter cube to number 3.
5. Engage the laser in continuous fire mode, and using a fluorescent target to view the position of the beam, adjust the periscope until the beam exits from the microscope. Fine adjustments can be made using the phase contrast objectives, centring the laser light in shadow of the objective's phase plate.
6. Stop the laser and continue following the Standard Operating Procedure to perform an experiment or fully stop the laser.