

# Risk Assessment

Background Information		Date: July 2017 Name of Assessor: Dr Stephen Wotton
Describe the product and application	Hamamatsu PLP-10-040C picosecond light pulser for precision spatial and timing measurement of single-photon sensitive sensors.	
Describe the Laser	Hamamatsu PLP-10 controlling a Hamamatsu 040C laser head. The laser is Class 3B pulsed, 405nm, 100MHz maximum repetition rate, 100ps maximum pulse width, solid state laser diode, 200mW peak power at laser head FC connector.	
Describe the Beam Delivery System	The laser beam is delivered by a closed fibre optic system into a light-tight enclosure. The beam exits the fibre where it is used to illuminate the device under test either directly or by diffuse reflection.	
Describe the Laser Process	The beam delivery fibre is usually mounted on an X-Y stage that allows the spatial response of the sensor to be measured by scanning the laser source across the surface of the device.	
Describe the Environment	The laser is located in room 880 used exclusively for the characterisation of photon-sensitive detectors and the development of electronics for the high speed readout of these sensors. Access to the room is by key issued to a restricted subset of the HEP group. The room itself is enclosed and air conditioned. It contains one laser and enclosure, mainly rack-mounted electronics for data acquisition, bench-top apparatus for characterisation of sensors, two PCs and miscellaneous small equipment.	
Who uses the product or could affect its operation?	Authorised users	
Underline the part(s) of the life cycle of interest	<i>Planning, Design, Manufacture, Testing, Transport, Installation, Commissioning, <b><u>Normal Operation</u></b>, Maintenance, Servicing, Modification, Decommissioning, Disposal</i>	

# Risk Assessment

## Single-photon sensor characterisation

		Assessed by: Dr Stephen Wotton	Assessment Date: July 2017 Review Date: July 2018	Activity/Facility Photon sensors Location: Cavendish Lab, Room 880	Assessed:
STEP 1	STEP 2	STEP 3			
List significant hazards	List groups of people who are at risk	List existing controls	Are these controls OK?	What is the risk factor from these hazards?	Actions Required
<b>The Laser</b>					
Equipment interconnections & possible damage to equipment.	All	Lasers are fully contained in the manufacturer's enclosure. Only qualified service personnel are permitted to open these boxes. The controller and laser head are located where accidental damage is unlikely.	Yes	Low	
<b>Beam Delivery:</b>					
Visible – retinal hazard Exposure to laser radiation, Class 3B, visible (405nm) wavelengths.	Users	The risk presents only if the beam-delivery fibre is uncoupled from the head, the fibre is damaged or the fibre is being manipulated for alignment purposes. These risks are covered by the users' safety briefing. The integrated exposure (even within the 0.25s reflex response) is reduced at lower repetition rates and lower power. The lowest rate and power required for the measurement should be used.	Yes	Low	
<b>The Laser Process:</b>					
Reflections of laser radiation from support structure	Users	The lowest light intensity and repetition rate required for the measurement is used. The laser beam is fully enclosed during measurements. During alignment, users may be exposed to diffuse scatter at a level that is safe to view ( <b>Class 3B only</b> ). Direct viewing of the beam is not possible due to the design, and exposure to specular reflections is prevented by the enclosure User training and the local rules emphasise shutting off of lasers whenever possible for interventions and avoiding reflections of laser light from supporting structures. The inside of the enclosure is blackened.	Yes	Low	
<b>Environment &amp; People:</b>					
Use by inadequately trained users	Users	All users must be authorised; before this can occur they must have received proper training. They must also sign a declaration that they have read the local rules.	Yes	Low	