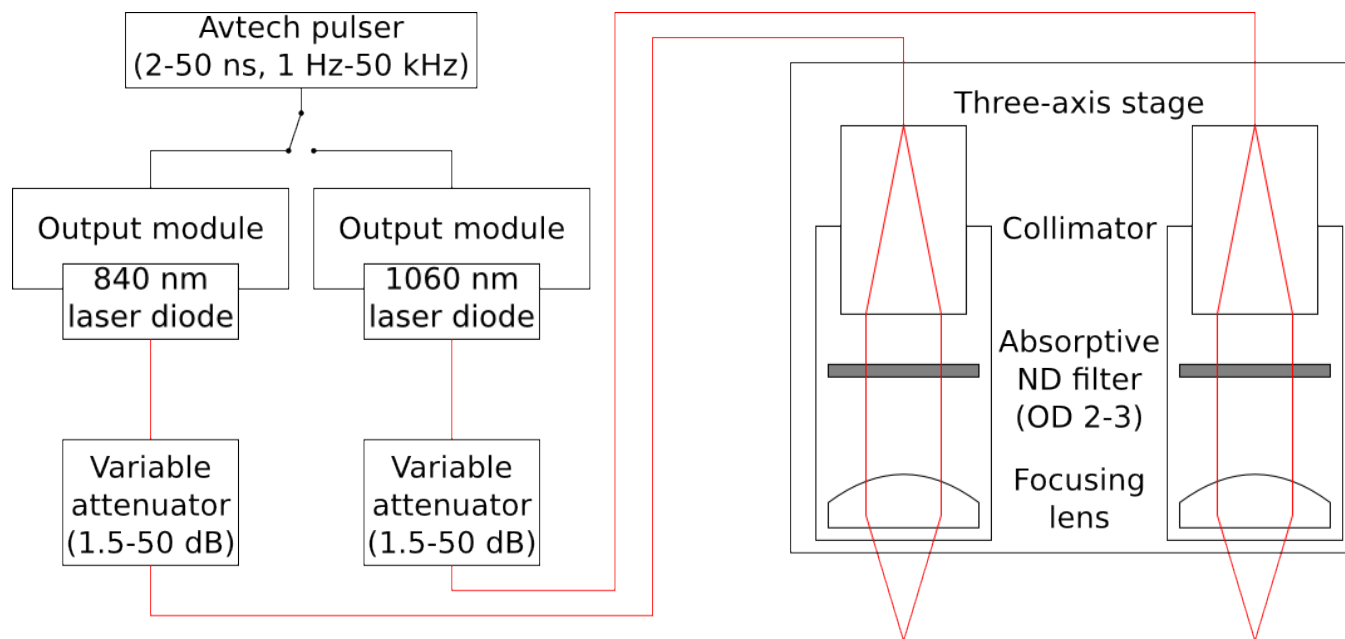


Laser safety information

The laser test stand uses a pair of Class 3R laser sources with Class 1 fiber beam delivery to experimental equipment. If the requirements for operation (see below) are met, the system is designed to meet Class 1 safety limits.

System diagram



Laser sources

- 840 nm laser diode: QPhotonics [QFLD-840-2SM](#), nominal output power 2 mW, max output power 3 mW, Class 3R
- 1060 nm laser diode: QPhotonics [QFLD-1060-10S](#), nominal output power 10 mW, max output power 14 mW, Class 3B

Laser diodes are bonded at their outputs to fiber pigtails connected to the beam delivery path. The diodes can only be powered using the output modules listed below.

Laser pulse generator

AVTech Electrosystems AVO-9A-B-P-P3-SLAA with output modules AVX-S1-P3-SLAA (for the 840 nm diode) and AVX-S1-P4B (for the 1040 nm diode).

Pulse generator has maximum pulse amplitude 10 V (200 mA into the 50-ohm impedances of the output modules) and maximum duty cycle 0.0025 (50 ns * 50 kHz).

Beam delivery

The laser diode pigtails are connected through adjustable fiber attenuators to the optical system (collimator, absorptive neutral density filter, and focusing lens) on the three-axis stage. The laser light is confined to a optical fiber or a light-tight lens tube at every point from the laser diode to the exit of the focusing lens. The stage is enclosed in a light-tight hutch.

Required for operation

- Laser operators for this system should review requirements for Class 1 and 3R systems in ESH Manual Chapter 10, Laser Safety; see
 - General Requirements: <http://www-group.slac.stanford.edu/esh/eshmanual/references/laserReqGeneral.pdf>
 - Class 2 and Class 3R Laser Operation Requirements: <http://www-group.slac.stanford.edu/esh/eshmanual/references/laserReqClass2and3R.pdf>
- Operators are recommended to take the ESH132 class: https://www-internal.slac.stanford.edu/esh-db/training/slaconly/bin/catalog_item.asp?course=132.
- The pulse inputs to the output modules **must** only be connected to the AVTech pulse generator. The DC bias inputs to the output modules are shorted to ground (as recommended by AVTech when not applying bias). This guarantees the laser diodes operate within Class 1 limits.
- For unattended operation, the hutch should be closed.