Quantum Light Instruments Ltd.
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Company code: 303315940 • VAT code: LT100008742017 • IBAN: LT88 7044 0600 0796 0177

Questionnaire form for custom-build pulsed laser

The laser design involves large number parameters to consider. Please tell us what parameters are most important for your task, and where compromises might be possible. We will do our best to deliver laser that is optimal for your task and has best possible performance/cost ratio.

To fill out the form, make sure the PDF file is NOT read-only. If the file is read-only save it first to a folder or computer desktop. Close this file and open the saved file.

Important fields are marked yellow, please fill them if applicable.

Contact information:

Name:

Email:

Address 1:   Building No.:

Address 2:

Postcode: City:

Country:

Laser radiation specifications:

Wavelength:

Specify required wavelength or several wavelengths. Extra wavelengths can be produced via harmonic generation (up to fifth harmonic is available) or Raman shifting.

Wavelength range:

If application allows to use slightly different wavelength, enter here allowed wavelength range. We might be able to select optimal for your task laser material that has slightly different output wavelength.

Exit port type:

Laser output can be fiber coupled or free-space.

Exit port configuration:

If more that one wavelength is required, provide details here whether all wavelengths needs to have single or separate output ports and/or specify your custom configuration. If fiber coupled output is selected specify fiber core diameter and length.

Wavelength tuneable? ☐ Yes

Tuning range:

If wavelength tunability is required, fill required tuning range or ranges here.

Pulse energy:

Specify pulse energy in mJ at each of wavelength of interest.

Linewidth:

Provide required linewidth of laser pulses. Most of Q-Switched lasers typically have < 1 cm^{-1} linewidth. Single Longitudinal Mode (SLM) Q-Switched lasers might have down to 0.01 cm^{-1} linewidth. OPO devices typically have linewidth in 4-6 cm^{-1} range. Picosecond and femtosecond lasers typically have linewidth in 1-300 cm^{-1} range.
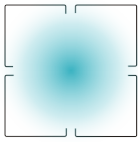
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Spectral purity:

Tell us about spectral purity required for laser radiation if several wavelengths are required. If all wavelengths should exit trough single exit port without separation, fill here "No separation". Spectral purity should be expresses as ratio of residual wavelength(s) to specified wavelength, for example 1:100 would specify 1 mJ residual wavelengths pulse(s) energy when specified wavelength output is 100 mJ.

Polarisation state:

Our lasers are producing linearly polarized light by default. If there are special requirements for polarisation state, provide details here.

Pulse repetition rate:

Specify required default (factory set) pulse repetition rate.

Repetition rate variable: ☐ Yes

Pulse repetition rate range:

If variable repetition rate is required, specify its range here.

Optimal pulse duration:

Pulse duration range:

Pulse duration of Q-Switched lasers depends on laser cavity parameters and could not be changed easily. Specify optimal pulse duration for your task and duration range is acceptable for your task.

Target M² factor:

Laser beam propagation characteristics typically is described by M^2 factor, which indicates how many times beam divergence is above diffraction limit. Alternatively, beam propagation can be described by its divergence at given beam diameter in the form fields below.

Beam divergence:

Specify beam divergence in mrad.

Beam diameter:

If required beam divergence is specified, beam diameter **MUST** be specified as well.

Beam profile:

Custom beam profile:

Select required beam profile from the dropdown list that has some common profile shapes. If "Custom" beam profile selected, provide its description in "Custom beam profile" field.

Laser control and monitoring

Internal pulse generator: ☐ Yes

Pulsed lasers are driven by pulse generator. Check the box above if internal pulse generator should be provided. Internal pulse generator operates at fixed frequency, that you should specify in the field below.

Internal pulse generator repetition rate:

Specify the factory-set pulse repetition rate of internal pulse generator.

Laser pulse jitter in respect to internal pulse generator:

Laser pulse is emitted with jitter in respect to control pulse. Specify here required jitter by your task.

External triggering: ☐ Yes

For many tasks laser needs to be triggered externally in order to sync pulses with external equipment. Check the box above if laser needs external triggering.

Laser pulse jitter in respect to external pulse generator:

Laser pulse is emitted with jitter in respect to control pulse. Specify here required jitter by your task.

Triggering method:

Laser external triggering can be done with single pulse (leading edge would control start of pump diodes, while falling edge would start Q-Switch), or with two separate pulses for pump diodes and Q-Switch.
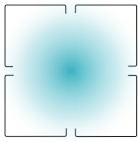
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Mode of operation:

Provide target mode of operation:
Continuous mode assumes that laser needs to be able to produce pulses at specified repetition rate for extended periods of time.
In Duty Cycle mode laser is activated at regular intervals, specify cycle duration and how long laser needs to be on during each cycle.
Batch mode assumes that laser will be producing preset number of pulses followed by extended cool-down period.
Single-pulse mode assumes that laser is operated at less than 1 Hz repetition rate and should be activated on-demand.

Details of operation mode:

Provide here details of operation mode: duty cycle value, number of pulses in batch etc.

Digital control/monitoring interface:

Specify what digital laser control/monitoring interface is preferable. If required digital control interface is not listed here, fill information into "Details..." field below. If analog control is needed, select "Other" and list parameters required to control in "Details..." field below.

Details of control/monitor interface:

Control software type:

Describe details of software required for laser control.

Details of control software:

Fill here details of control software like operating system, hardware etc.

Laser safety requirements:

Our laser includes standart set of laser safety features – interlock for stopping of the laser, emergency stop interlock, dry controls fo activation of user equipment. Provide details of safety features required for your task.

Expected number of pulses during lifetime of laser:

Specify approximate number of pulses that laser will produce during its lifetime. That would us to optimise laser design and performance/cost ratio for your task.

Target lifetime of the laser:

Provide your insight about expected duration of laser use in years. For industrial applications the laser lifetime typically is shorter due new technology and/or process developments.

Physical specifications:

Cooling method:

Provide information what cooling method would be optimal for you. Convective cooling system does not use fans, however, size of it is largest. Forced-air cooling would require smaller heatsink, while Cold-plate method would allow to transfer laser generated heat using water or other agent.

Provide more details about cooling method.

Fill in your requirements if you selected "Other" cooling method.

Environment temperature range:

Laboratory environment can be specified as 20-24 deg Celsius. Military specifications typically are from -40 deg to +70 deg Celsius. Wider operating temperature range typically result in higher cost of device.

Environment pressure range (altitude range):

Sea level atmospheric pressure is ~100 kPa. 3 km above sea level pressure drops to ~70 kPa.
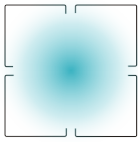
Environment humidity range:

Relative humidity in laboratory conditions typically is in 10-80 % range. Outdoors humidity can reach 100%.

Single housing design: ☐ Yes
Single housing design would integrate laser electronics together with laser head and cooling system (heatsink).

Target footprint:

Target weight:

Provide expected laser footprint and weight in the fields above.

Split housing design: ☐ Yes

Split housing design can be used when laser head and electronics can be separated in two or more sub-units. Please provide target weight and footprint of each of the units in the fields below.

Number of subunits and their footprint:

Weight of subunits:

Vibration profile:

Vibration profile details:

Please provide details about vibration environment the laser will operate. Several typical environments are listed in the "Vibration profile" list. If "Other" is selected, please provide details in "Vibration profile details" field.

Powering:

Input voltage range:

Specify laser powering method in the fields above. If laser is powered from AC mains, provide also AC frequency value in "Input voltage range" field.

Application:

Tell us more details about your application, if possible.

Important: Save the completed PDF form (use menu File - Save).