Registering a new pulsed light source

The EasyTau software maintains an internal database of "registered" light sources. The basic parameters for each source can be entered through the dialogue window shown in Fig. 1.
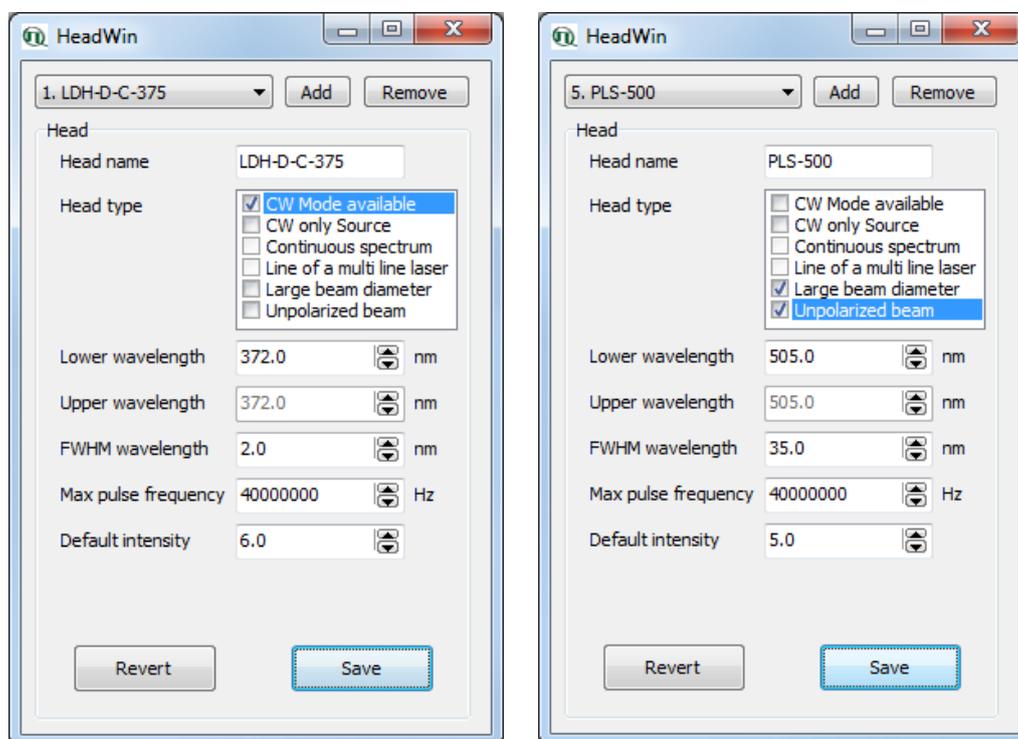

Fig. 1: Dialogue window for registering new pulsed light sources.

Head name can be set arbitrarily, however we recommend you to adhere to the naming convention established by PicoQuant for heads of the LDH or PLS Series.

Head type describes the properties of the emitted radiation and allows wizards to recognize when polarizers are necessary or what is the most suitable way of beam attenuation. The following parameters are available:

Element	Description
CW Mode available	*Check this box if the pulsed laser also supports continuous wave emission (e.g., dual mode LDH diode laser heads).*
CW only Source	*Check this box if this source supports only continuous wave mode.*
Continuous spectrum	*Should be selected when dealing with a white light source (i.e. Xe lamp or super-continuum laser).*
Line of a multi line laser	*Check this box, if the laser features several emission lines.*
Large beam diameter	*Check this box if the light source has a large beam diameter; mostly used for LEDs.*
Unpolarized beam	*Select this box if your light source emits unpolarized light (e.g., for LEDs).*

Lower wavelength and *Upper wavelength*: these two data fields can be used to define the wavelength range of a white light source (i.e. for sources with *Continuous Spectrum* selected under *Head*

type). When using an LED or diode laser, the lower wavelength data field is used to set its wavelength. In this case, the *Upper wavelength* data field is grayed out and shows the same value as the *Lower wavelength* field. These values are to define a single wavelength for IRF measurements or a range of reasonable wavelengths, as well as to provide information on the spectral bandwidth of excitation. Wizards use these parameters when e.g., evaluating the requested scanning ranges, avoiding intense scattered laser light from reaching the detector, or prevent transmission of second order peaks in emission spectra.

The *FWHM wavelength* data field allows defining the wavelength width of the light source at half maximum of the specified emission peak.

Max pulse frequency sets the upper limit for pulse repetition rate. Note that red laser heads are capable of pulsing at 80 MHz, while blue lasers are typically limited to 40 MHz and some UV LED sources have a maximum pulse rate of 10 MHz.

For diode lasers, *Default intensity* should be set to a level slightly above the lasing threshold (which is different for each LDH head) where the output is already stable and has the shortest optical pulse duration. For LEDs from the PLS Series, this setting is simply a driving intensity corresponding to the best compromise between output power and optical pulse duration.