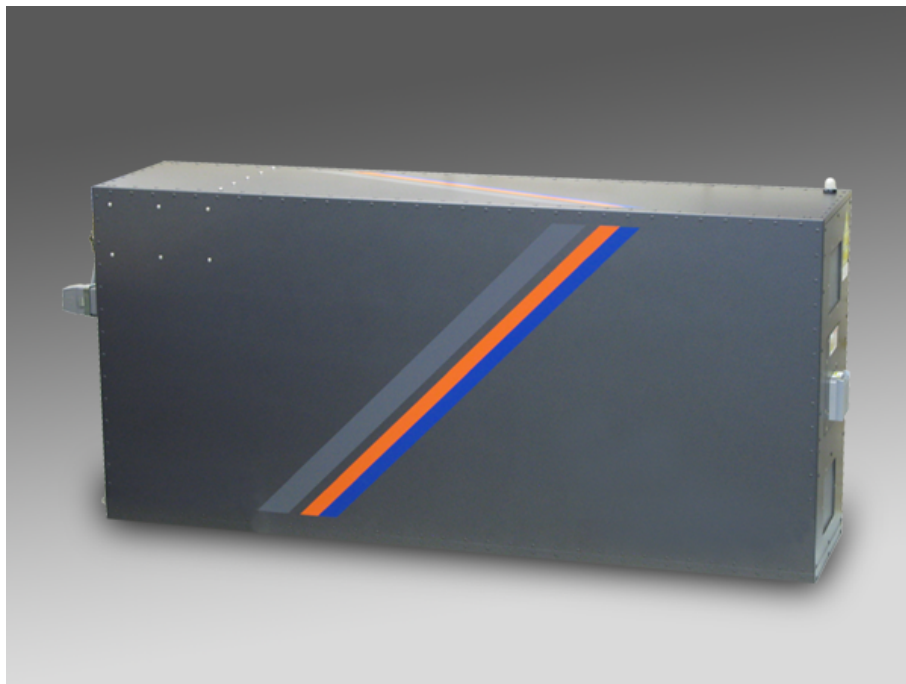


Product-Manual

COMPex Pro

Item-Number(s): 1103170



LAVISION

WE COUNT ON PHOTONS

Product-Manual for **DAVIS 8.2**

LaVision GmbH, Anna-Vandenhoeck-Ring 19, D-37081 Göttingen

Produced by LaVision GmbH, Göttingen

Printed in Germany

Göttingen, September 27, 2013

Document name: 1005718_CompexPro_D82.pdf

Contents

1 Hardware Installation	5
1.1 Mechanical	5
1.2 Wiring Connections	5
1.3 Remote Control	6
1.4 COM port settings	9
2 DaVis Hardware Setup	11
2.1 Timing Setup	13
2.2 Line Configuration	14
3 Device Settings	15
3.1 Recording	15
3.2 Laser Control	15

1 Hardware Installation

This manual describes only the features relevant for **DAVIS** control of the COMPex Pro. Please refer to the COMPex Pro user manual concerning the general features and mechanical setup of the laser.

1.1 Mechanical

Please see COMPex Pro user manual for details concerning the mechanical setup, power and water supply and the required gas connections.



Figure 1.1: Transportation screw at the back of the laser housing; please remove before operating the laser

As is shown in Fig. 1.1, please remove the transportation safety screw at the back of the laser housing. This is clamping the vacuum pump for safety reasons during transport.

1.2 Wiring Connections

Fig. 1.2 schematically shows the cable connections required between the **DAVIS** PC and the COMPex Pro. The crossed RS232 cable is used for communication in remote control operation mode of the laser while the trigger signals are sent via the BNC connection.

All connection sockets are located at rear side of the laser housing, see Fig. 1.3. Please connect the RS232C cable at the port labeled **COM1**, while the terminal must be connected to socket **COM2 (Terminal)**. The BNC socket for external triggering is labeled **Trig. In**.

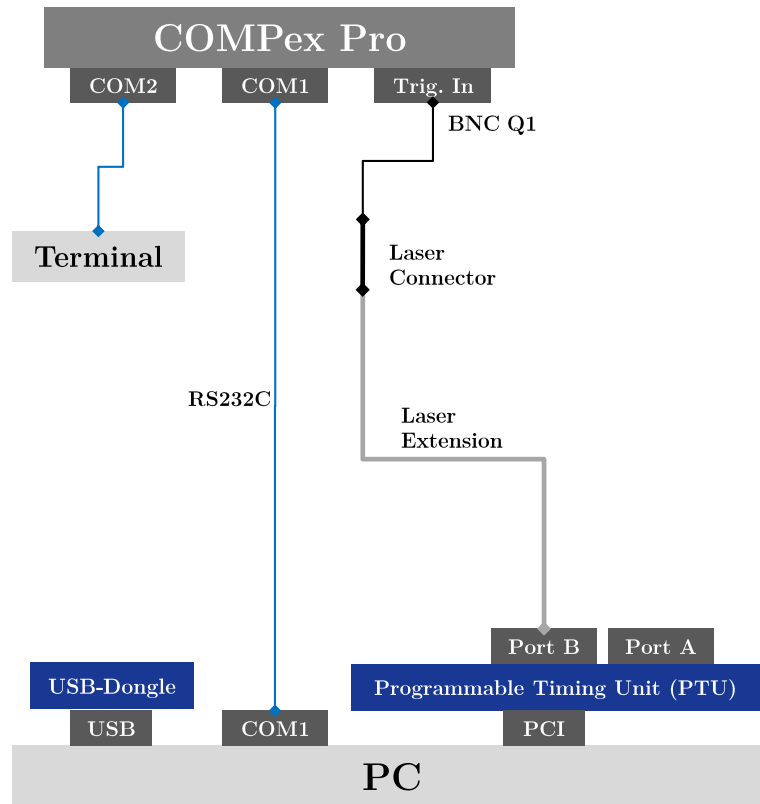


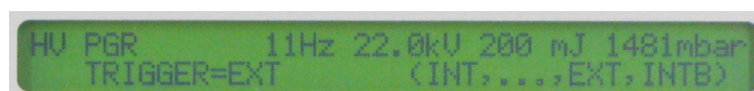
Figure 1.2: Wiring connection for COMPex Pro

1.3 Remote Control

To enable the remote control via **DAVIS** please power-on the laser, firstly by switching on the reg mains switch, secondly by rotating the key switch which enables the internal control circuit. These controls are located at the upper rear of the laser housing, shown in Fig. 1.4.

The COMPex Pro is controlled via the external terminal shown in Fig. 1.5 which enables all operation features and maintenance procedures. To enable **DAVIS** control of the COMPex Pro please follow the instructions below. The corresponding terminal buttons are displayed in Fig. 1.6.

External trigger: To enable the external triggering via the **Trig. In** socket at the laser housing please press button **Trigger Int/Ext** at the terminal and use the arrow buttons to select the EXT entry.



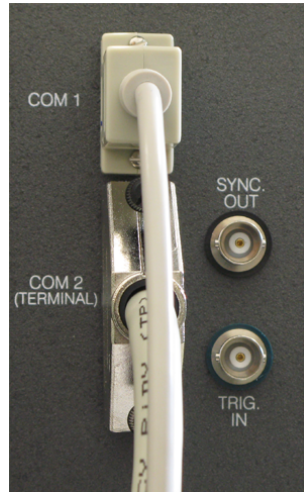


Figure 1.3: Sockets at laser housing



Figure 1.4: Controls at the rear of the laser housing; the mains switch is located on the left side, the key switch on the right



Figure 1.5: Terminal for full control of the COMPex Pro

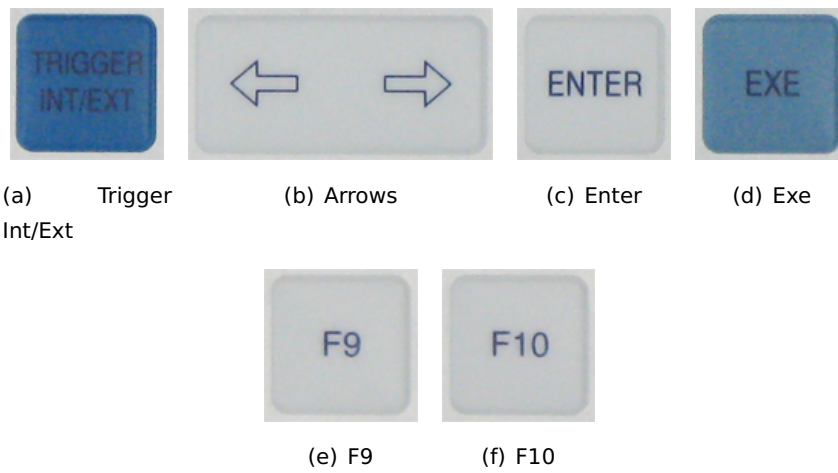


Figure 1.6: Selected buttons at the terminal

1.4 COM port settings

Press the **Enter** and **Exe** buttons to confirm and execute the selection.

COM1 mode: The mode of COM1 at the laser housing must be set to be used as another terminal. To do so, please select the **F10** button and select the COM1MODE entry.



HU PGR EXT 22.0kV 200 mJ 1481mbar
COM1MODE (SHUTDOWN, COM1MODE, TIMEDATE)

Press **Enter** and select the **TERM** mode using the arrow buttons.

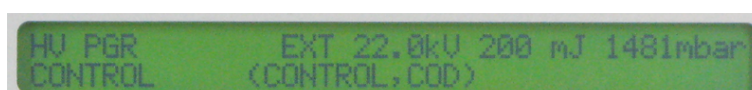


HU PGR EXT 22.0kV 200 mJ 1481mbar
COM1MODE=TERMINAL (INACT, TERM, SER, OLD)

Confirm the selection pressing **Enter** and **Exe**.

Control: Transfer the control to the PC connected at the **COM1** socket of the laser housing. This enables the laser control via **DAVIS**. Otherwise, the communication cannot be established and initialization of the laser will fail. In order to perform all the required maintenance and service operations, control must be transferred to the terminal again.

Press **F9** and select CONTROL using the arrow buttons on the terminal.



HU PGR EXT 22.0kV 200 mJ 1481mbar
CONTROL (CONTROL, COD)

Press **Enter** and select the HOST entry for remote control via the PC (Select TERMINAL instead for re-transferring control to the terminal).



HU PGR EXT 22.0kV 200 mJ 1481mbar
CONTROL=HOST (HOST, TERMINAL)

Use the **Enter** and **Exe** to confirm the selection.

1.4 COM port settings

In case that the communication between the internal control PC of the COM-Pex Pro and the **DAVIS** PC can not be established the reason may be false

COM port settings. The rate of the corresponding port of the **DAVIS** PC can be modified in **DAVIS**. The rate must be essentially the same as for the remote PC. The following functions can be used to modify COM port settings in **DAVIS**:

- `void SetBaudRate{int thePort, theBaudRate}`

This function will set the baud rate of COM port `thePort` to a value of `theBaudRate` in bps.

- `void SetComFastMode{int port}`

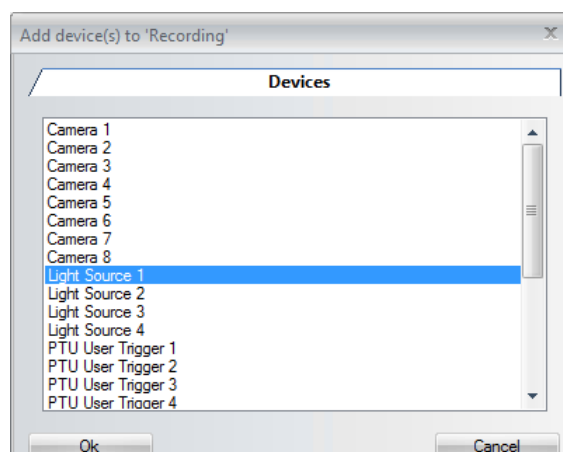
In some cases communication can only be established if the COM port port of the **DAVIS** PC is set to fast mode.

2 DaVis Hardware Setup

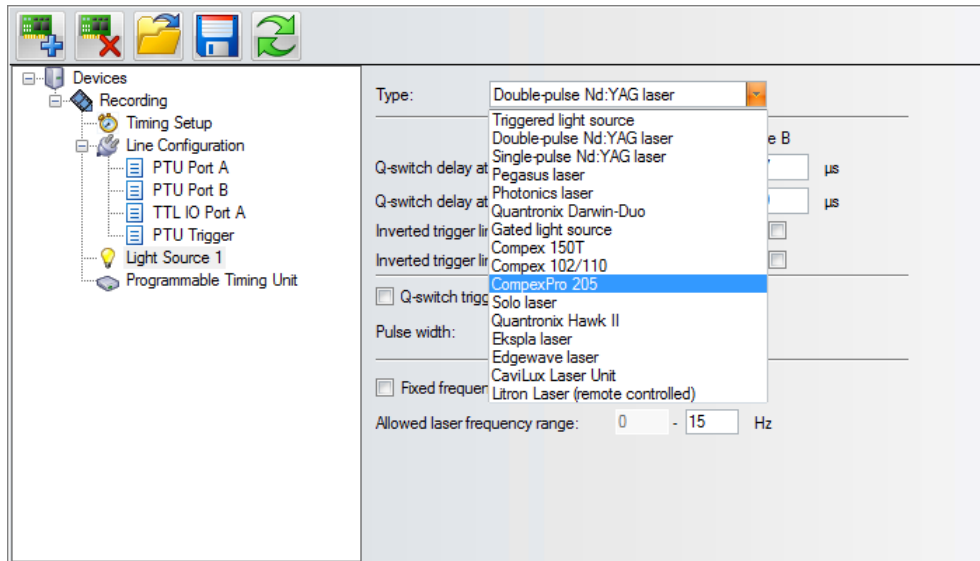
To install the COMPex Pro in the **DAVIS** software open the **Hardware Setup** dialog after start of the **DAVIS** software pressing the **Setup** button. It is assumed that a Programmable Timing Unit (PTU) is already installed on this system.



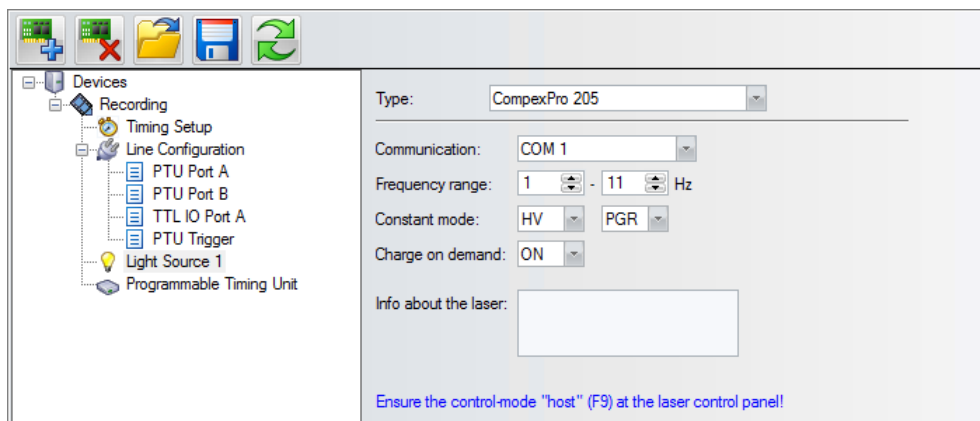
The COMPex Pro is implemented as a light source which is part of the image recording. Select the **Recording** item in the tree view and click onto the **Add** button in the tool bar. Mark **Controlled Light Source 1** in the list and click onto **Ok** to add a new light source to the hardware setup.



Clicking onto the added **Controlled Light Source 1** item in the **Recording** tree select **COMPex Pro** from the **Type** drop-down list. Please select the appropriate **Communication** port (serial).



To apply these settings to the hardware setup in **DAVis** press the **Initialize** button. When both, the communication cable and power supply are connected properly to the COMPex Pro initialization will be successful. This will be indicated by displaying “Ok” as status of the added Controlled Light Source, i.e. the COMPex Pro.



Communication: This field shows the COM port used for remote control.

Frequency range: Please set the allowed range of the repetition rate of the laser here entering a minimum and a maximum repetition rate.

Constant mode: It is possible to operate the laser either with a constant output pulse energy (“EGY”) or applying a constant voltage (“HV”). For the former selection the voltage of the tube will be adjusted accordingly while for the latter the output pulse energy may vary depending on the ageing of the gas filling.

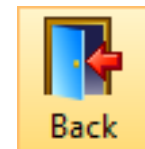
2.1 Timing Setup

Simultaneously, the laser is operated in the modes of “partial gas replacement” (PGR) or “no gas replacement” (NGR). Since with increasing age of the gas filling the voltage may have to be increased to maintain a certain pulse energy, the laser automatically replaces a part of the gas in PGR mode if the voltage has reached a certain limit. After the gas replacement the voltage is automatically set to a lower value.

Charge on demand: If the COD mode is set to “On” the capacitors are only charged after the laser has received an external trigger signal. If set to “Off” the voltage is always kept at the given high voltage level. Enabling the COD mode has the advantage that the life time of the capacitors and all other high voltage devices is increased while furthermore preventing self triggering and unwanted laser emission. However, this operation mode incorporates a much longer intrinsic delay of the laser, increasing from about 2 μ s if COD mode is off to 12 ms if COD mode is enabled. The change of intrinsic delay is taken into account by **DAVIS** to ensure synchronization of all devices.

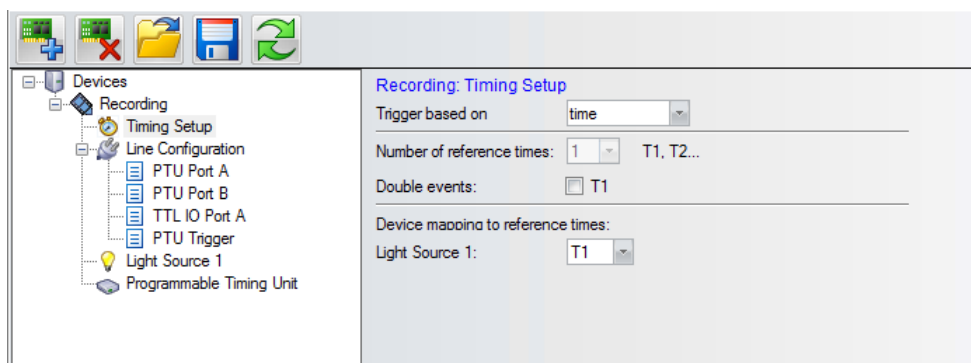
Info The information on laser type, serial number and software version are displayed here.

Close the setup dialog to return the project manager of **DAVIS**.



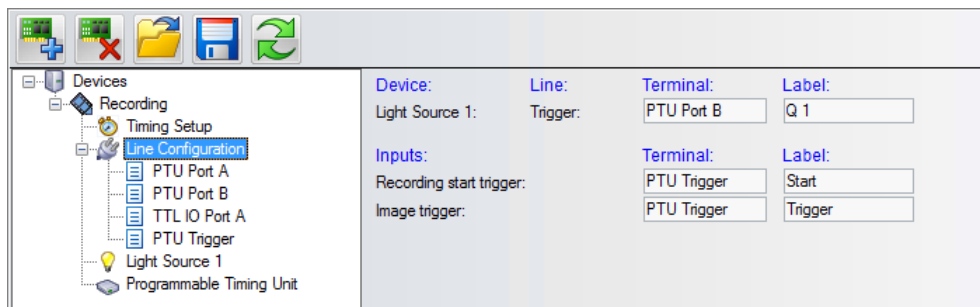
2.1 Timing Setup

In this dialog it is possible to assign a reference time to the COMPex Pro. In the given case the laser is connected to reference time **T1**. Please select the desired reference time from the corresponding drop-down list. Please keep in mind that the number of available reference times is a hardware feature of the PTU.

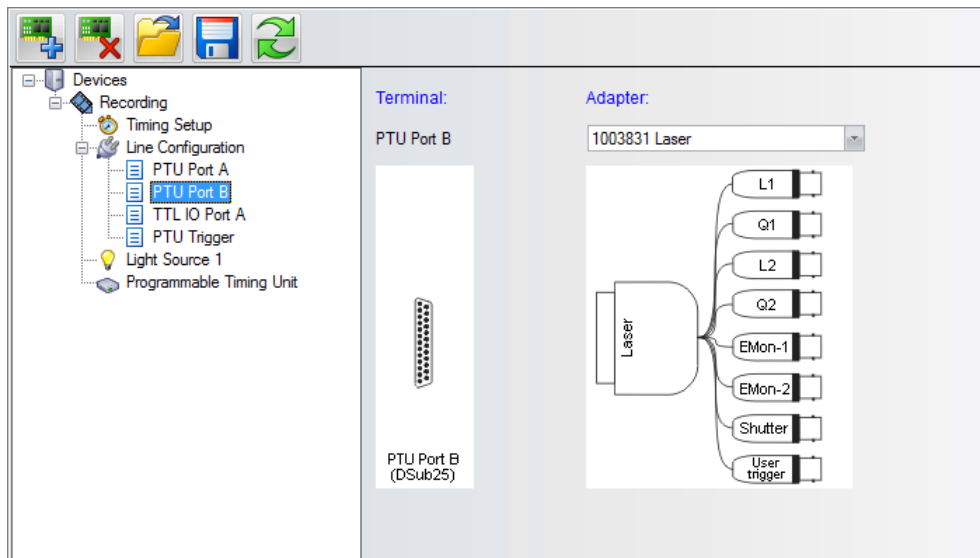


2.2 Line Configuration

Using the **Line Configuration** card in the **Recording** tree of the **Hardware Setup** dialog the user can declare the **Laser Adapter** type that provides the laser with the required trigger signals. There are default adapters for certain systems but in general there are different adapters available that can be used. Therefore it is required to make sure that the correct adapter and trigger line is selected in the particular setup.



For the COMPex Pro the trigger signals are sent on only one line. By default the laser adapter **#1003831 Laser** is used on **Terminal: PTU Port B** and the BNC cable with the **Label: Q1** is connected to the trigger input of the COMPex Pro.



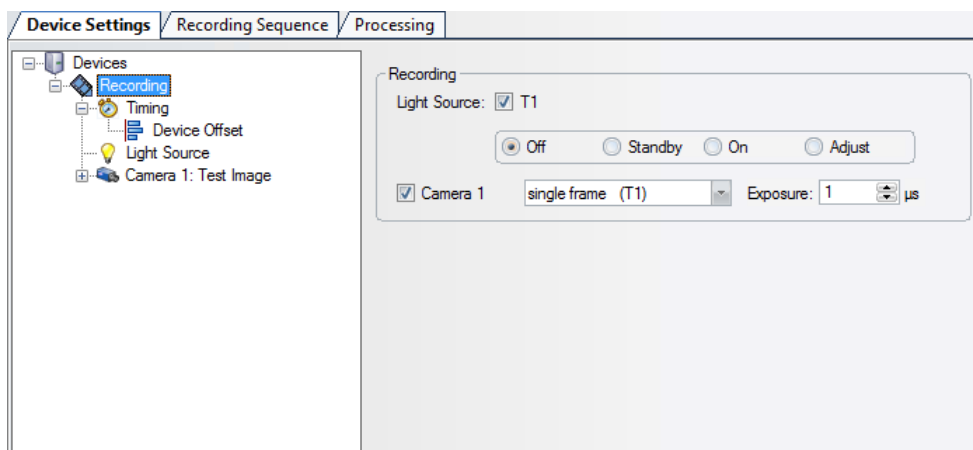
3 Device Settings

The **Devices** card can be opened using the **Setup** button, e.g. in the **Recording** or **Calibration** dialog.



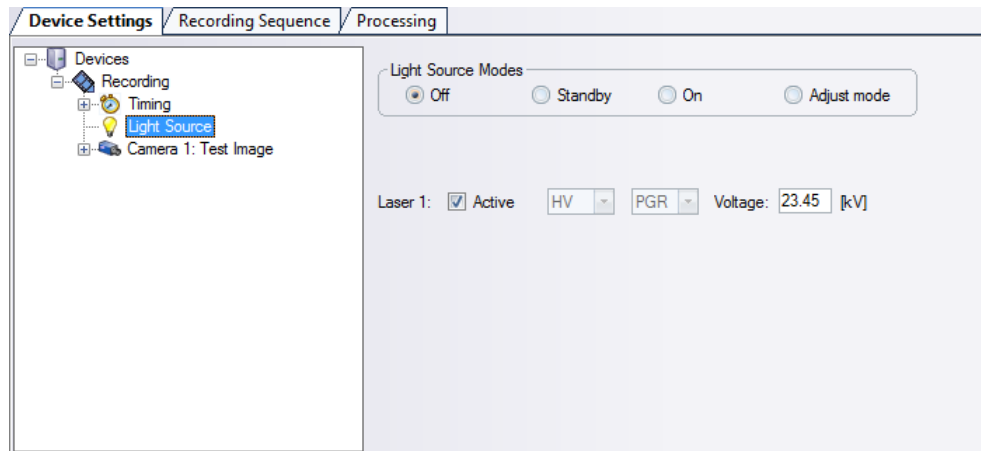
3.1 Recording

On the **Recording** card it is possible to generally activate the COMPex Pro and to determine the laser mode (off, standby, on, adjust). These functions are also available on the **Laser Control** card. Please check the corresponding Sec 3.2 for details.



3.2 Laser Control

The **Laser Control** card can be opened using the **Device** button. The **Laser Control** dialog allows to activate the COMPex Pro by setting the corresponding flag and to select the operation mode.



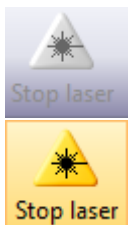
For the operation mode of the laser there are four options:

Off: No laser emission. The laser receives no trigger signal.

Standby: Only the high voltage is enabled, but the laser will not receive any trigger.

On: Emission from the laser synchronized with the acquisition of images. The laser receives a trigger signal if an image is taken, during a recording it is fired with the specified **Recording rate** on the **Timing** card.

Adjust mode: Emission from the laser at the specified **Trigger rate** on the **Timing** card. The laser is continuously. This mode can be used for alignment purposes as there is laser emission without image acquisition. For safety reasons put the protective cap on the camera lens!



As soon as the laser operation mode is set to Standby, On or Adjust Mode the laser button in the tool bar will be activated. Clicking onto this button will set the operation mode to **Off** and disable the laser button.

The laser can be enabled and disabled clicking onto the tick box. The general operation modes from the hardware setup are only displayed here. Please refer to Sec. 2 for details. Depending these settings this dialog offers the following entries:

HV: This is the value for the high voltage in kV. Please press **Enter** to apply the changes.

Energy: This is the pulse energy in mJ. Please press **Enter** to apply the changes.

Please refer to the “DaVis 7.2 Software” product manual (Item-Number 1003001) for further details on the device settings.



LA VISION

WE COUNT ON PHOTONS

LaVisionUK Ltd

Downsview House/ Grove Technology Park
Grove, Oxon, Ox 12 9FF/ UK
www.lavisionuk.com
Email: sales@lavision.com
Tel.: +44-(0)-870-997-6532
Fax: +44-(0)-870-762-6252

LaVision GmbH

Anna-Vandenhoeck-Ring 19
D-37081 Goettingen, Germany
www.lavision.com
Email: sales@lavision.com
Tel.: +49(0)551-9004-0
Fax: +49(0)551-9004-100

LaVision, Inc.

211 W. Michigan Ave., Suite 100
Ypsilanti, MI 48197, USA
www.lavisioninc.com
Email: sales@lavisioninc.com
Phone: +1(0)734-485-0913
Fax: +1(0)240-465-4306