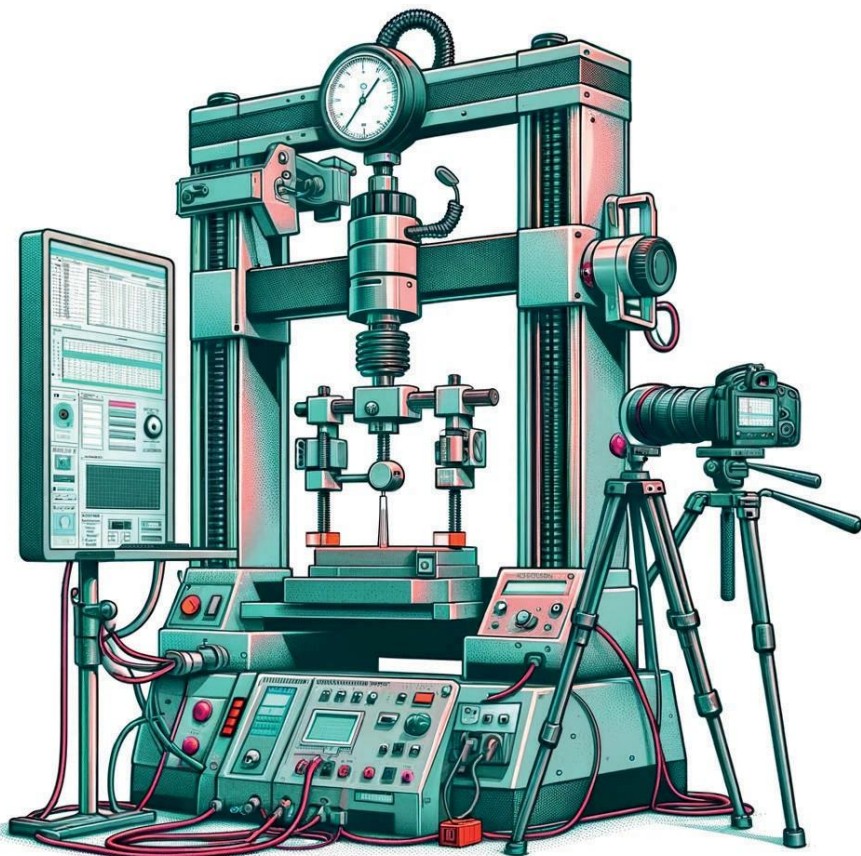




# X-SIGHT OPTICAL EXTENSOMETER SOFTWARE KIT





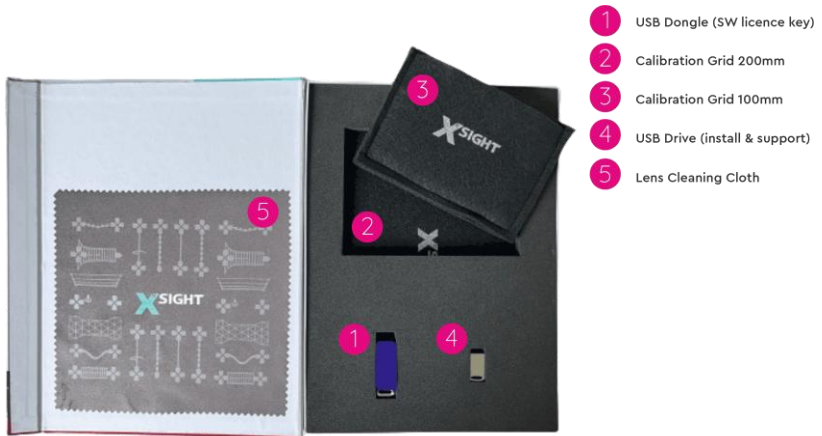
Dear customer,

Thank you for purchasing our optical extensometer BOX. You are only a few steps away from getting your new system up and running. To complete the setup, you'll need a few additional components available from your local industrial camera and/or photographic equipment dealers. Alternatively, you can reach out to your local X-Sight dealers for accessories. Once everything is connected, you're ready to start measuring.

The included USB dongle provides a license for the Axial module of the X-Sight Alpha DIC software. This can be upgraded anytime to incorporate more tools using a modular approach or to complete the DIC system with full functionality.

Your X-Sight team

## Inside box:

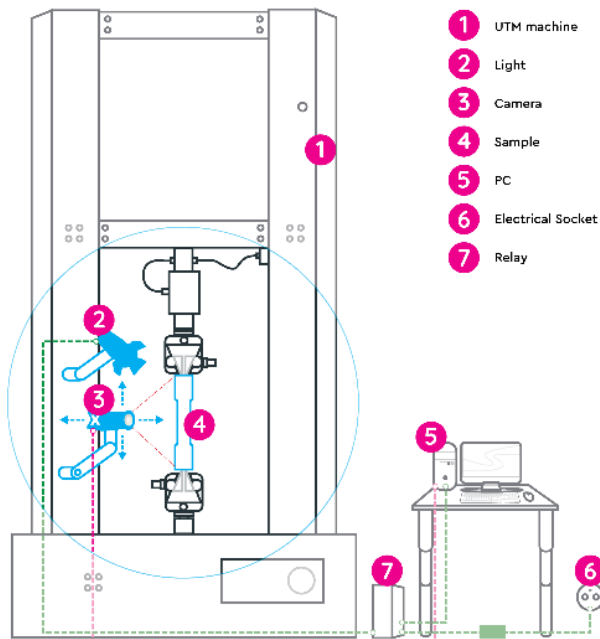


Your new SW LICENCE KEY includes a **perpetual licence** and **one year of TECS** (Technical Enhancements & Customer Support).

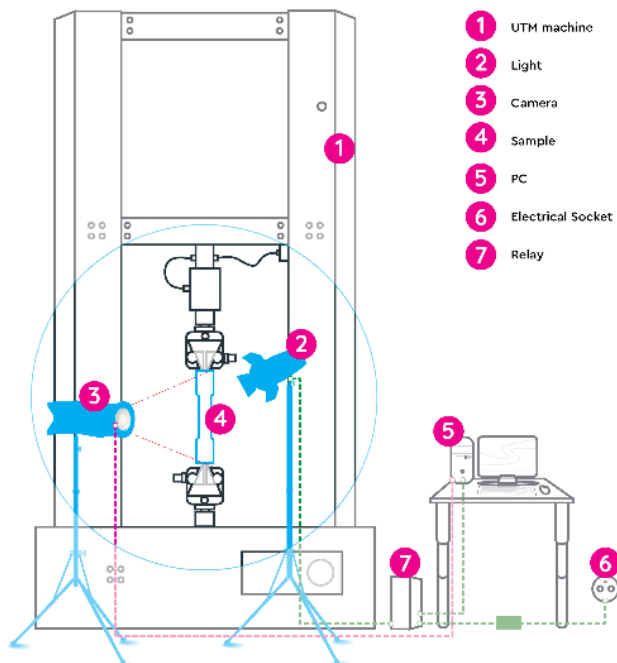


## Typical Use:

### ✦ Mounting Arm:



### ✦ Tripod Use:





## 1. Camera Selection

Choose an area scan monochromatic camera for the best results, as colour images are converted to grayscale. Global shutter cameras are recommended for their superior outcomes. The standard interface is USB 3.0 for ease of use, supporting both power and data transfer within a 5-meter limit. For longer distances, opt for a Gigabit Ethernet camera, noting the need for a PoE (Power over Ethernet) supply or an external power source.

Supported camera brands include:

- ❖ FLIR (formerly Point Grey)
- ❖ Allied Vision Technology
- ❖ Basler
- ❖ Optris
- ❖ IDS
- ❖ Ximea
- ❖ Daheng
- ❖ Direct show web cameras
- ❖ i-Speed 7
- ❖ Hikrobot

Select a lens and monochromatic camera within the visible spectrum, using a 0.01-pixel multiplier for resolution calculation.

## 2. Lens Selection

When selecting a lens, consider your camera's sensor size. Common sizes include 1/3", 1/2", 2/3", 1.2/2", and 1". Opt for a lens designed for your sensor's size or larger to avoid dark corners in your images.

$$\frac{\text{sensor length [mm]}}{\text{focal length [mm]}} = \frac{\text{field of view [mm]}}{\text{working distance [mm]}}$$

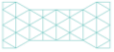
$$\text{field of view [mm]} = \frac{\text{sensor length [mm]} \cdot \text{working distance [mm]}}{\text{focal length [mm]}}$$

For sensor size, refer to the physical length of your camera sensor's longer side. This detail is usually noted in the camera datasheet. Alternatively, it can be calculated by multiplying the number of pixels in a row by the pixel size (for example, 2448 pixels × 3.45 μm = 8.45 mm).

Ensure the camera's field of view is sufficiently wide to cover both the gauge length and any movement or deformation of the object being measured.

## 3. Illumination and Light switch

Good illumination of the field of view is essential for optimal image quality. The colour of the light does not significantly impact extensometer applications. When using a dimmable LED light source, it is recommended to use them at full power to prevent flickering. For static tests, select a light source of at least 2000 lumens for each 1000 mm of measured sample length. For dynamic measurements, light intensity should be significantly higher to negate any external light variations. The illumination must be strong enough to enable setting the shutter speed to less than 10 ms (recommended to achieve a 100 Hz sampling rate) for static testing, and

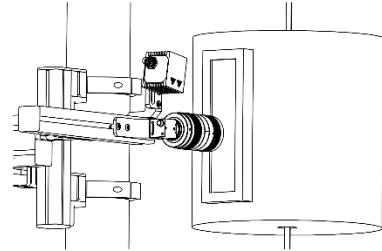
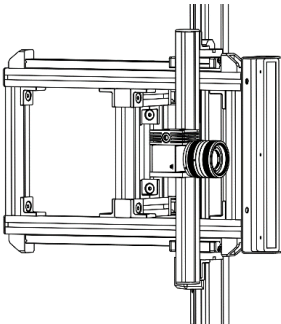


may need to be shorter for dynamic tests, depending on the test speed.

We recommend using standard LED lights mounted on a tripod or mounting arm and purchasing our USB Light Switch Relay (*X-Sight catalogue ► Devices & PC Components*), which can be controlled directly from the Alpha DIC software. For temporary measurements, battery-powered lights are recommended.

#### 4. Mounting Bracket/Tripod

First, decide how to connect the camera and light to the testing machine or your experimental setup. You can do this by designing and making a mounting arm (see *Mounting Arm example on the image on page 3*), for which we recommend using an aluminium or carbon building kit system (Item IPS, Rexroth, CarboSix).



*Example of an advanced mounting arm in detail:*

Alternatively, you can use a simple tripod (see *Tripod Use example on image on page 3*) with the proper load capacity. For light positioning, we recommend using the "magic arm" joint bracket components.

#### 5. Camera Mounting

For mounting the camera to either the mounting arm or a tripod, we recommend using the X-Sight designed camera coolers (*X-Sight catalogue ► Mounts*). These are specifically created to enhance passive cooling, a necessity for the stable operation of your camera. The coolers are compatible with tripod mounting through a 1/4" UNC thread or a through-hole for an M6 screw and are available as accessories for a range of cameras. They are suitable for most standard machine vision cameras. Ensure that the light is positioned to avoid the space directly below the camera to prevent heat from affecting the air around the camera.



## 6. Measured Data Transfer

The X-Sight Alpha DIC software offers several methods for transmitting measured values:

**Digital** - This option allows multiple values to be transmitted in ASCII format via TCP/IP or RS232 (serial port). Additionally, the Alpha DIC software can be controlled remotely with API commands. For more details on digital communication capabilities, please refer to the *advanced manual* on the USB dongle.

For those looking to integrate with the **LabView** measurement chain, our technical support can provide digital communication script templates, including those for API use.

**Analog** - The X-Sight Alpha DIC software is compatible with analogue converters, such as those of Measurement Computing Corporation or Advantech.

## 7. Wiring the components

Before installing the software, ensure the camera, light, and light switch are correctly connected to the computer and have all necessary power wiring in place.

If your setup involves multiple cameras or requires external synchronization, properly connect the camera synchronization connector.

To complete this step, follow the installation instructions manuals for the

camera, light, and other accessories, such as the light switch.

## 8. Software Installation

Insert the provided USB dongle and drive into your PC, follow the installation guide, and set up the Alpha DIC software.

- ❖ Insert the violet SW license key into any available USB port on your PC.
- ❖ Connect the silver USB drive containing the installation and support files to a USB2 or USB3 port on your PC.
- ❖ Proceed by following the *ALPHA-Installation Guide* to install the camera, relay drivers, and Alpha DIC software.
- ❖ Navigate to the *Manual\Alpha\_VideoGuide* folder.
  - Watch the *01-INITIAL-SETTING* video.
  - Watch the *02-CALIBRATION* video and for more calibration grid sizes ask local dealer.

For more details, please read the manual and see our video tutorials at [www.xsight.eu](http://www.xsight.eu)

### USB drive contains:

- ❖ Installation files
- ❖ Advanced manual
- ❖ Video guides
- ❖ X-Sight catalogue
- ❖ Datasheets



## Accessories:

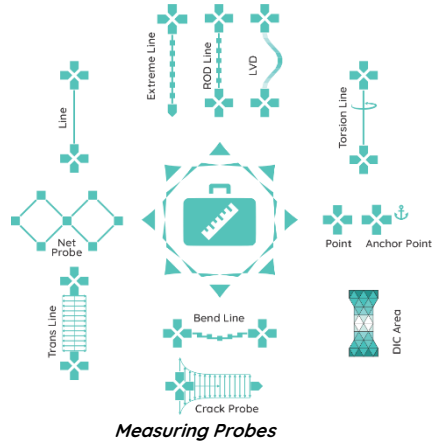
- ❖ **Relay** (► Accessories)  
The X-Sight 2-channel USB Relay for switching the light.
- ❖ **Synchron** (► Accessories)  
X-Sight advanced dynamic events synchronization device.
- ❖ **Pulsegen** (► Accessories)  
The X-Sight digital output for incremental encoder inputs.
- ❖ **Wireless Sync** (► Accessories)  
The X-Sight accurate wireless camera sync system.
- ❖ **Camera Cooler** (► Mounts)
- ❖ **Stereobar** (► Mounts)
- ❖ **Mounting arm** (► Mounts)
- ❖ **BL300**(► Light)  
Background light



## X-Sight Alpha DIC software modularity:

The X-Sight Alpha DIC software is split into several modules. Modules group different measuring probes or advanced features.

This approach allows for building a simple and cost-effective extensometer that allows modules to expand quickly. If users need many different functions, it is more effective to use a DIC license instead of many modules.



Module	Designation	Available probes
AX	<i>Axial Strain</i>	
TR	<i>Transversal Strain</i>	
TO	<i>Torsional</i>	
DIC	<i>DIC Area</i>	
NET	<i>Net Probe</i>	
DI	<i>Device Input</i>	
CL	<i>Crack Length</i>	
LVD	<i>Line Value Distribution</i>	
ITT	<i>Intelligent Tensile Test</i>	
PP	<i>Post Process</i>	
RES	<i>Research</i>	
AX3D	<i>3D Functionality</i>	

- Basic modules
- Additional tools & features
- Advanced modules

# X SIGHT

