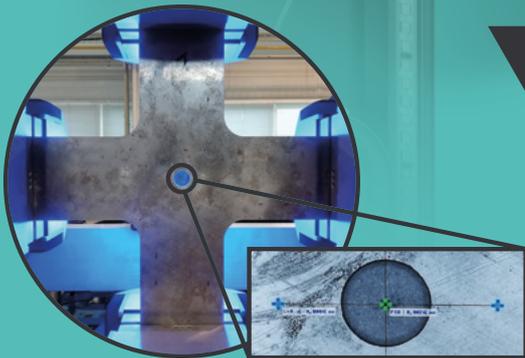
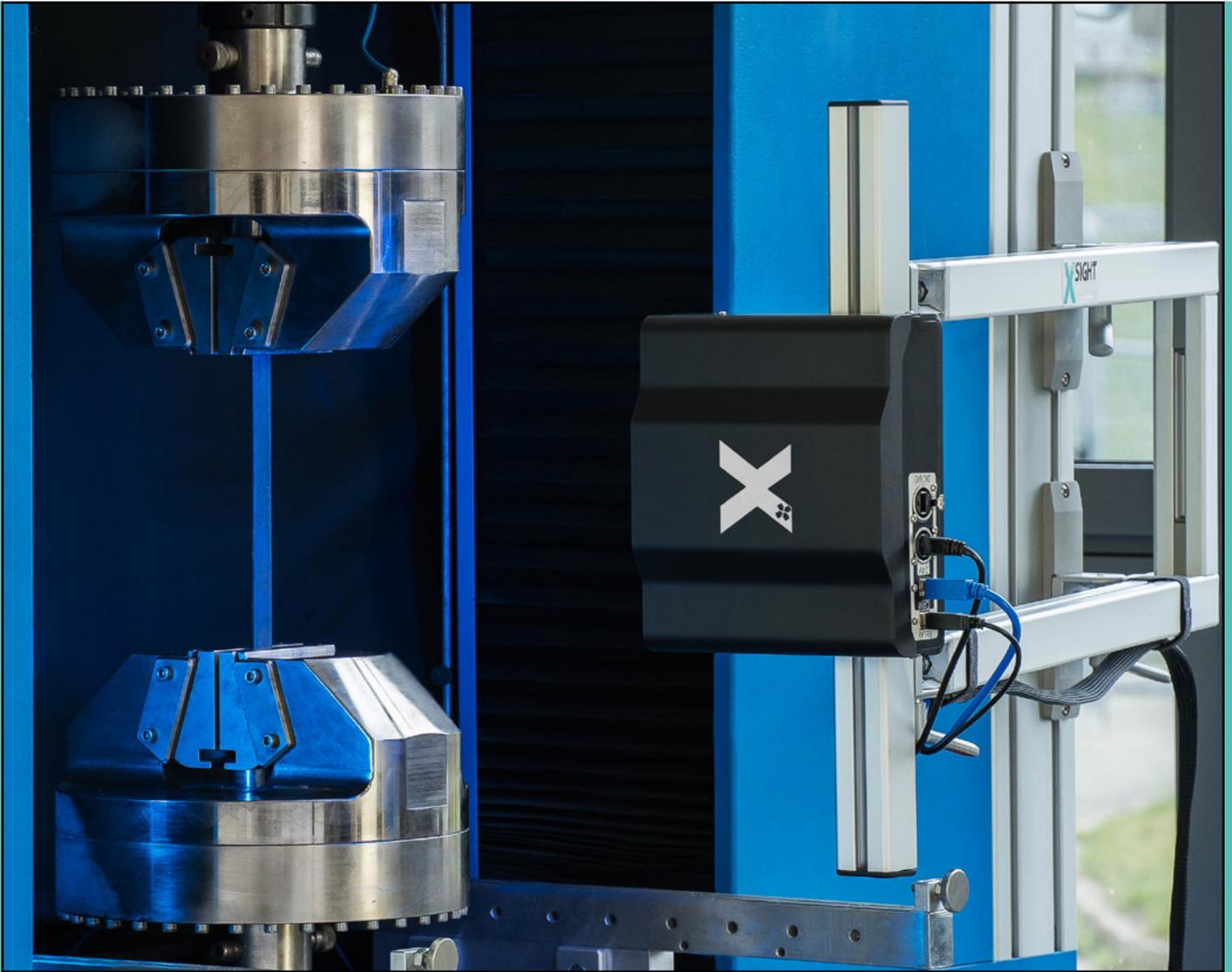




# OPTICAL EXTENSOMETERS



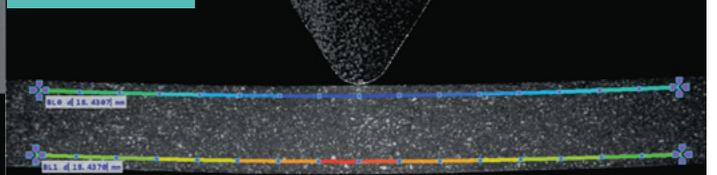
EXTENSOMETRY &  
STRAIN ANALYSIS



TENSILE TESTING



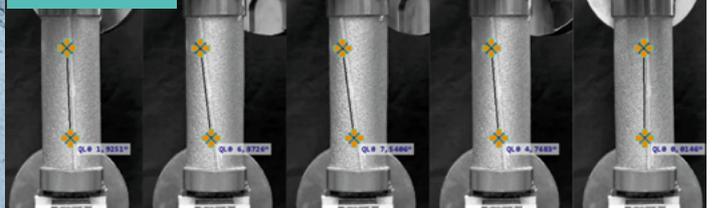
FLEXURAL TESTING



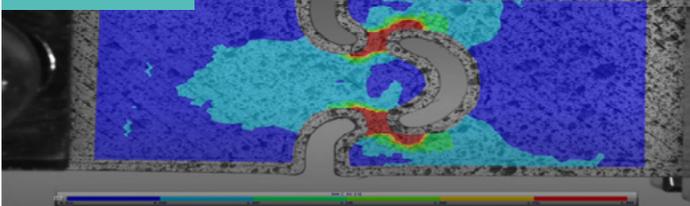
BIAXIAL TESTING



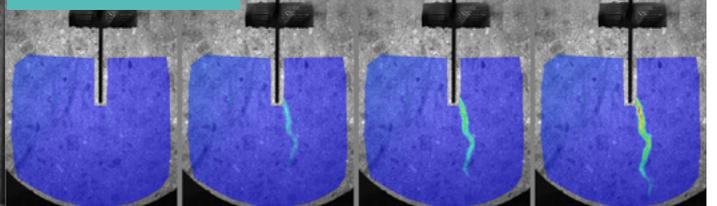
TORSION TESTING



SHEAR TESTING



CRACK PROPAGATION



## LINE-BASED PROBES

**Point**

A basic measuring probe for displacement determination.

**Bend Line**

A probe designed to be used during bending tests. Measures strain over a curved shape and enables the visualization of the strain distribution in real-time.

**Line**

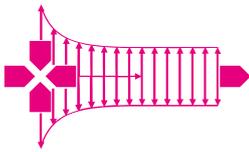
An elementary measuring probe for strain and length determination.

**Extreme Line**

Advanced probe for axial neck detection, provides an improved E-modulus reading.

**Torsion Line**

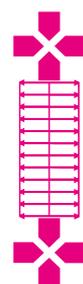
Enables dual position angular twist and strain measurement.

**Crack Probe**

Measures a crack length during static or dynamic tests.

**ROD Line**

Advanced line measurement probe with axial neck detection feature for samples with oxide or rust layer.

**Trans Line**

Used for multi-positional transversal measurement with averaged and min/max width functions.

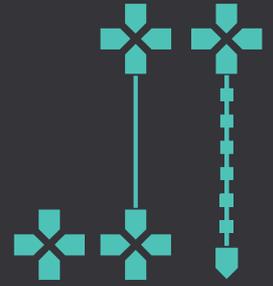
## FULL-FIELD PROBE

**DIC Area**

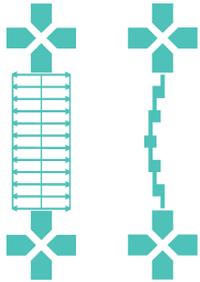
A full-field probe for strain and displacement distribution mapping. Supports evenly triangulated mesh as well as mesh based on user-defined points.

## AX - AXIAL STRAIN

Allows for measurement of axial strain in real-time. In addition to the elementary measuring probes such as Point probe and Line probe, the Alpha Axial Strain measurement module includes the Extreme Line probe that divides the length of the specimen into multiple precisely defined gauge segments and detects the necking area. This function provides an advantage over conventional single-position measurement, wherein a rupture outside the gauge length area causes test invalidity.



Basic UI and mandatory module

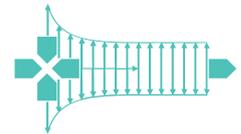


## TR - TRANSVERSAL STRAIN

Allows for real-time measurement of transversal strain. The Alpha Transversal Strain measurement module includes the Trans Line probe with an edge detection feature. The Trans Line offers single or multiple line width measurements, providing an advantage over conventional single-position measurements. All lines can be averaged for a precise Poisson's ratio reading.

## CL - CRACK LENGTH

This module is designed for crack length measurement of compact tension (CT) or double cantilever beam (DCB) specimens. Line probe function is included in the CL module. Line probe enables crack opening measurement providing results comparable to conventional devices.



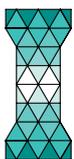
## TO - TORSIONAL

Allows for measurement of angular twist on cylindrical specimens in two positions. Usable in static and dynamic applications.

## PP - POST PROCESS

This module unlocks a remarkably efficient tool for processing of previously recorded tests with sub-sequent playback and data export. Each real-time measurement method can have multiple offline records with a custom probe layout. Post-Process is an optimal solution for measurement of unique or expensive specimens and components.

rec

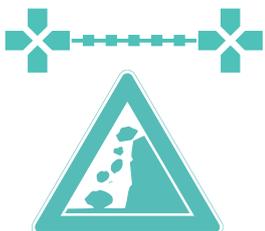


## DIC AREA

This module provides a strain or displacement distribution map, thereby enabling to obtain maximum available data from each experiment. This feature surpasses other technologies on the market. It helps users all over the world not just to improve the understanding of their experiments, but thanks to an easily interpretable output, also to sell their results effortlessly.

## LVD - LINE VALUE DISTRIBUTION

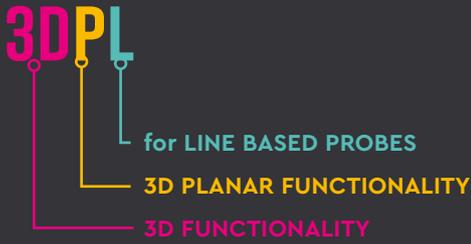
While a full-field strain distribution via DIC Area analysis usually requires postprocessing due to a high number of computational points, the Line Value Distribution module provides a colourful value visualization feature that is more feasible during real-time measurements. It is supported by most types of probes that are divided to line segments, specifically strain distribution for Extreme, ROD and Bend Lines, including an additional choice of Deflection or Curvature for Bend Lines.



## ITT - INTELLIGENT TENSILE TEST

An advanced feature for measuring specimens with an outside layer creating fragments that eventually fall off. A typical application is a tensile test of reinforcing steel bars with a layer of oxide or rust.

# VE 3D MODULES DESCRIPTION



	PRICE	FULL-FIELD PROBE	LINE BASED PROBES	3D PLANAR FUNCTIONALITY	3D FUNCTIONALITY
3D	\$\$\$	●	●	●	●
3DL	\$\$	×	●	●	●
3DP	\$\$	●	●	●	×
3DPL	\$	×	●	●	×

## 3DPL – 3D PLANAR FOR LINE BASED PROBES

The 3DPL module offers basic planar stereoscopic functionality tailored for use with line-based probes in video extensometry. It is specifically designed for flat surfaces and allows for measurement without the need for sample marking. This module provides a straightforward solution for applications where only planar measurements are required.

## 3DP – 3D PLANAR FUNCTIONALITY

The 3DP module is designed for video extensometry applications on samples that are initially flat and may possess reflective surfaces. This module allows for the analysis of such materials without the necessity of marking the samples. At the start of the test, it is crucial that the sample be positioned in a plane to ensure accurate measurements.

## 3DL – 3D FOR LINE BASED PROBES

The 3DL module is a video extensometer functionality, eliminating the need for the test sample's movement to be confined to a single plane during experimentation. It incorporates line-based probes for precise measurement and requires the marking of the sample for accurate tracking and analysis.

## 3D – FULL 3D FUNCTIONALITY

The 3D module combines Digital Image Correlation (DIC) with stereo vision, unlocking complex functionality for measuring displacement and surface strain fields of 3D objects. It is the most universal measurement method within DIC systems, offering unparalleled versatility and precision. This module stands out as the most comprehensive solution for analyzing the mechanical behavior of materials and structures in three dimensions, making it an indispensable tool for a wide range of applications in research and industry.

### 3D PLANAR FUNCTIONALITY

This module is designed for video extensometry applications on samples that are initially flat and may possess reflective surfaces. At the start of the test, it is crucial that the sample be positioned in a plane to ensure accurate measurements.

### 3D FUNCTIONALITY

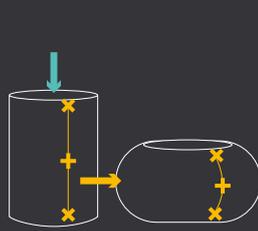
It eliminates the need for the test sample's movement to be confined to a single plane during experimentation.



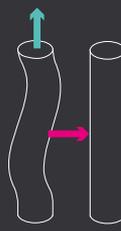
Straight → Tilted



Straight → Bent (Buckling)



Straight → Barrel-shaped



Curved → Straight



Coupling (Multi-plane points)



3D surface component

## 2000 SERIES

The X-Sight 2000 series optical extensometer in 200 mm housing

## 4000 SERIES

The X-Sight 4000 series optical extensometer in 400 mm housing

### 2109

- Mpx Resolution (02,05,09,16)
- Number of Camera Units (1-3)
- Model Series Designation

### 4116-(D)-(3D)

- Dual Camera, 3D setup
- Mpx Resolution (02,05,09,16)
- Number of Camera Units (1-3)
- Model Series Designation



### SINGLE MODE

The most common setup. Multiple single cameras can be used simultaneously.

### JOINED MODE

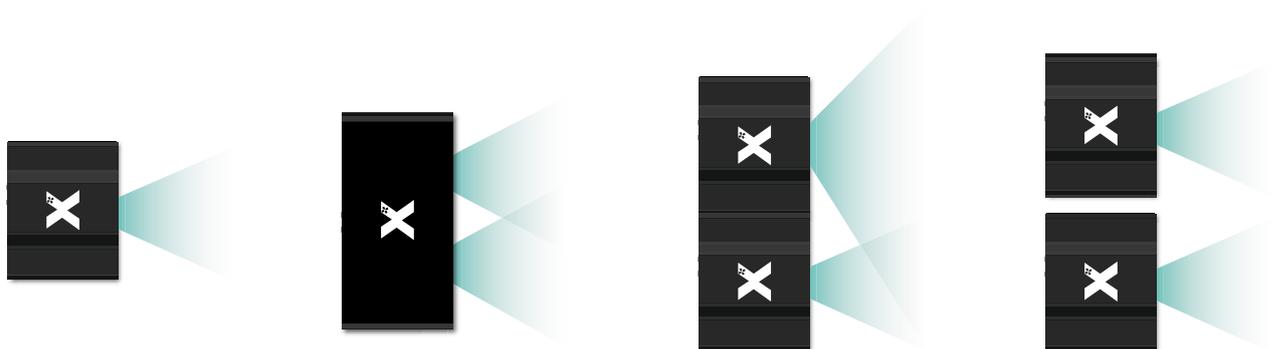
Identical FoVs where a point can travel between cameras.

### DUAL FOV MODE

An uncommon setup with different resolutions.

### SEPARATED FOV MODE

This mode is designed for long specimens with relatively small extensions or deformations.



### 2000 SERIES OPTICAL EXTENSOMETER

The 2000 series optical extensometers are smart and easy-to-use devices for routine testing in both industrial and R&D environments. The compact housing includes a monochromatic LED bar and can be mounted directly to a testing machine frame, creating a lean test setup, or fixed to a tripod using standard screw threads. The lens is easily accessible and can be changed quickly to equip the measuring device for diverse applications.

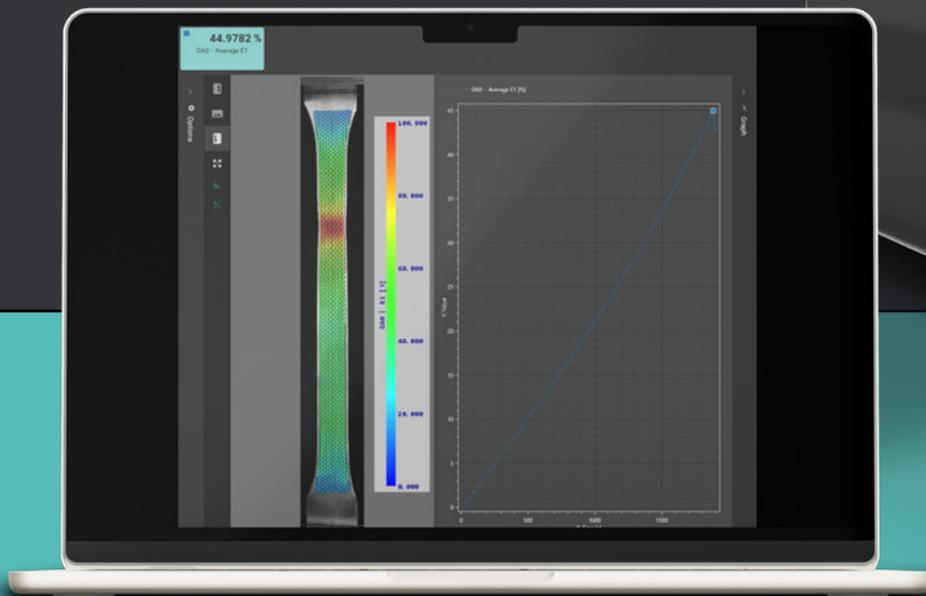
datasheet



Interface	Light per unit	Dimensions [mm] per unit	Lens mount
USB 3.0	L200	221 × 187 × 80	C

### FEATURES

- ▶ Compliance with ISO 9513 and ASTM E83
- ▶ Compliance with ISO 6892-1 and ASTM E8 in the strain rate control mode
- ▶ Usable with most ISO and ASTM for determination of tensile properties for metallic materials, plastics, elastomers, composites, concretes, and many more
- ▶ Applicable to high-temperature and climate chamber measurements
- ▶ Simple to use with operator mode
- ▶ Axial and radial neck detection and many more features
- ▶ Easily implementable into the automatic lines
- ▶ Wide palette of measuring tools for advanced deformation analyses



MODEL	Typical sampling Rate [Hz]	Sampling Rate at Full View [Hz]	Measurement length [mm]	
			Class 0.5	Class 1
X-Sight-2101	200	170	80	160
X-Sight-2102	90	43	110	190
X-Sight-2105	175	75	130	260
X-Sight-2106*	200	60	-	-
X-Sight-2109	75	32	220	440
X-Sight-2116	70	23	330	660
X-Sight-2201	200	170	2 × 80	2 × 160
X-Sight-2202	90	43	2 × 110	360
X-Sight-2205	175	75	2 × 130	520
X-Sight-2206*	200	60	-	-
X-Sight-2209	75	32	420	840
X-Sight-2216	70	23	640	1280
X-Sight-2301	200	170	3 × 80	3 × 160
X-Sight-2302	90	43	3 × 110	530
X-Sight-2305	175	75	3 × 130	760
X-Sight-2306*	200	60	-	-
X-Sight-2309	75	32	620	1240
X-Sight-2316	70	23	920	1900

\*ASTM focused VE

MODEL	WORKING DISTANCES [mm]									
	Class 0.5					Class 1				
	12	16	25	35	50	12	16	25	35	50
X-Sight-2x01	127	169	297	455	685	285	380	621	909	1338
X-Sight-2x02	-	134	237	322	430	176	253	416	571	785
X-Sight-2x05	156	213	357	520	710	335	459	737	1054	1480
X-Sight-2x09	169	233	378	519	720	364	494	758	1063	1485
X-Sight-2x16	262	352	556	782	1122	533	714	1122	1575	2254

- Compliant to ISO 9513
- Lens Focal Length [mm]
- x = Number of Camera Units (1-3)

X-Sight-2106  
(ASTM) series  
datasheet



X-Sight  
2000 series  
video



### 4000 SERIES OPTICAL EXTENSOMETER

The 4000 series is a universal optical extensometer suitable for a wide range of material and component testing such as tensile, compression, flexural, shear, and torsional tests.

The 4000 series provides a larger illuminated area than model 2000 series. This makes it a better choice for longer or high-elongating specimens. The device measures strain, total length, delta length angle, and much more.

VE 4000 series  
datasheet



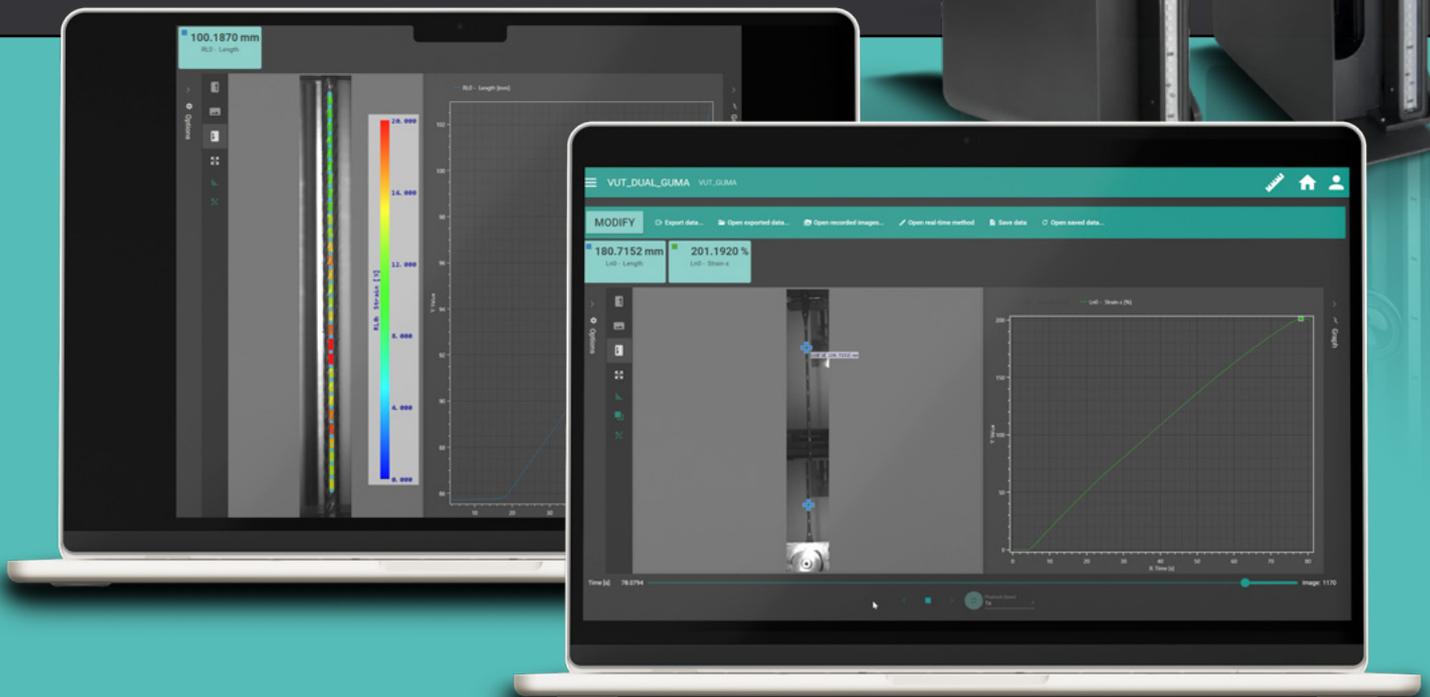
VE 4000-D series  
datasheet



Interface	Light per unit	Dimensions [mm] per unit	Lens mount
USB 3.0	L400	421 × 187 × 80	C

### FEATURES

- ▶ Compliance with ISO 9513 and ASTM E83
- ▶ Compliance with ISO 6892-1 and ASTM E8 in the strain rate control mode
- ▶ Usable with most ISO and ASTM for determination of tensile properties for metallic materials, plastics, elastomers, composites, concretes, and many more
- ▶ Applicable to high-temperature and climate chamber measurements
- ▶ Simple to use with operator mode
- ▶ Axial and radial neck detection and many more features
- ▶ Easily implementable into the automatic lines
- ▶ Wide palette of measuring tools for advanced deformation analyses



MODEL	Typical sampling Rate [Hz]	Sampling Rate at Full View [Hz]	Measurement length [mm]	
			Class 0.5	Class 1
X-Sight-4101	200	170	80*	160*
X-Sight-4102	90	43	110*	220*
X-Sight-4105	175	75	130*	260*
X-Sight-4109	75	32	220*	440
X-Sight-4116	70	23	330	660
X-Sight-4101-D	200	170	150 or 2 × 80	300 or 2 × 160
X-Sight-4102-D	90	43	200 or 2 × 110	360
X-Sight-4105-D	175	75	240 or 2 × 130	520
X-Sight-4109-D	75	32	420	840
X-Sight-4116-D	70	23	640	1280
X-Sight-4201	200	170	2 × 80*	2 × 160*
X-Sight-4202	90	43	2 × 110*	2 × 220*
X-Sight-4205	175	75	2 × 130*	2 × 260*
X-Sight-4209	75	32	2 × 220*	820
X-Sight-4216	70	23	2 × 330	1280

\*Consider 2000 series VE as the 400mm LED is not necessary

MODEL	WORKING DISTANCES [mm]									
	Class 0.5					Class 1				
	12	16	25	35	50	12	16	25	35	50
X-Sight-4x01	127	169	297	455	685	285	380	621	909	1338
X-Sight-4x02	-	134	237	322	430	176	253	416	571	785
X-Sight-4x05	156	213	357	520	710	335	459	737	1054	1480
X-Sight-4x09	169	233	378	519	720	364	494	758	1063	1485
X-Sight-4x16	262	352	556	782	1122	533	714	1122	1575	2254

- Compliant to ISO 9513
- Lens Focal Length [mm]
- x = Number of Camera Units (1-3)

### 4000 SERIES



### 4000-D SERIES



### 2 × 4000 SERIES



## 4000-3D SERIES OPTICAL EXTENSOMETER

The X-Sight 4000-3D Series is a universal stereoscopic video extensometer (3DVE) equipped with two cameras to capture spatial movements and deformations. Its 3D capability minimizes errors caused by out-of-plane movements, enhancing measurement accuracy. The 3DVE offers simultaneous measurements, enabling data collection at different positions or with various gauge lengths. It measures strain, total length, delta length, angle, and more, making it ideal for comprehensive material testing, advanced research, and quality control applications that require 3D data analysis.

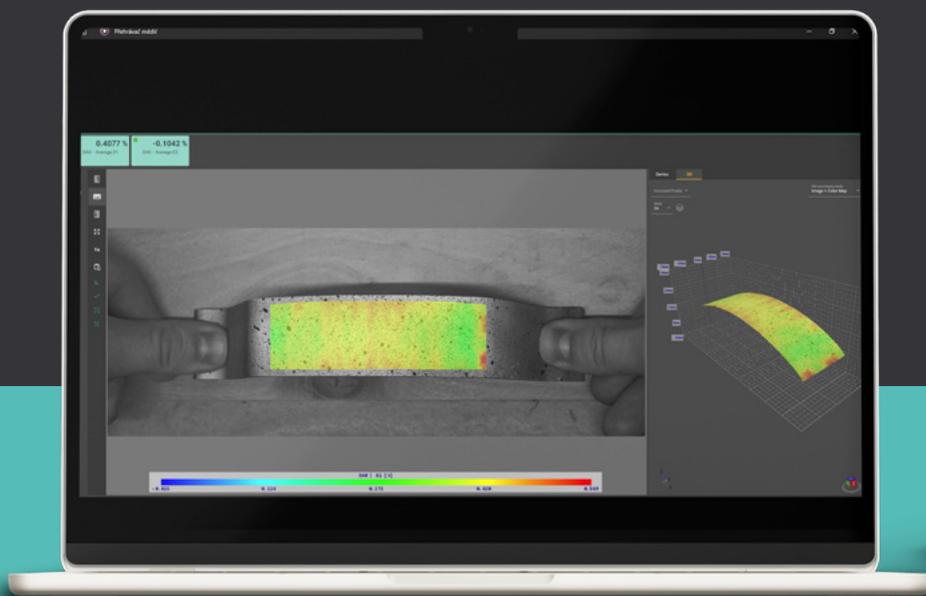
[datasheet](#)



MODEL	Typical sampling Rate [Hz]	Sampling Rate at Full View [Hz]	Measurement length [mm]	
			Class 0.5	Class 1
X-Sight-4105-3D	175	75	110	220
X-Sight-4109-3D	75	32	220	440

MODEL	WORKING DISTANCES [mm]							
	Class 0.5				Class 1			
	12	16	25	35	12	16	25	35
X-Sight-4x05-D	-	190	300	440	290	380	620	-
X-Sight-4x09-D	165	230	380	558	360	485	775	-

- Compliant to ISO 9513
- Lens Focal Length [mm]
- x = Number of Camera Units (1-3)



### HT (HIGH TEMPERATURE) OPTICAL EXTENSOMETER

HT is a high-temperature optical extensometer. It uses advanced digital image correlation for precise analysis of thermomechanical and thermophysical properties. The HT hardware device is presently the most Xsighting device for high-temperature strain measurement up to 1800 °C. HT combines high-precision measurement with a user-friendly graphic interface so that the user can fully focus on the experiment during uniaxial or biaxial tensile, compression, and shear testing. HT is suited not only for measurement using furnaces but for any application which requires high-precision reading over a small field of view.

datasheet



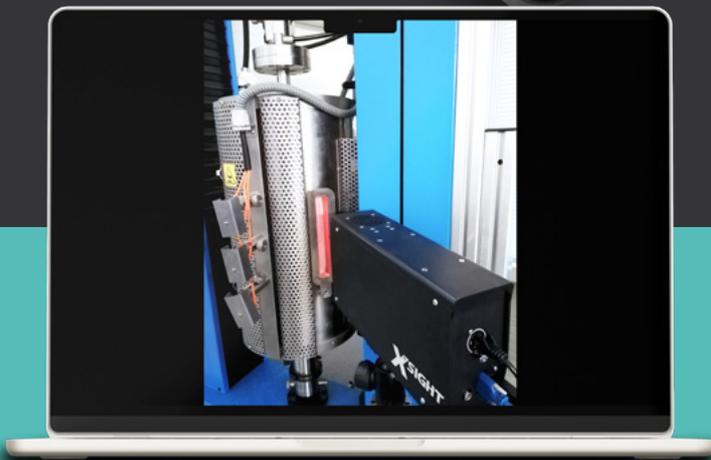
MODEL	Resolution [Mpx]	Typical sampling Rate [Hz]	Sampling Rate at Full View [Hz]	Lens type	Resolution [ $\mu\text{m}$ ]*	Measurement length [mm]	working distance [mm]
X-Sight-HT	5	175	75	Telecentric	<0.5	47	262 $\pm$ 1%
X-Sight-ST-HT	5	175	75	Semi-telecentric	Depends on camera	59-93	140-1000



ST-HT MODEL



HT MODEL



### SOFTWARE KIT

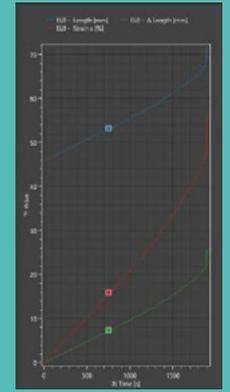
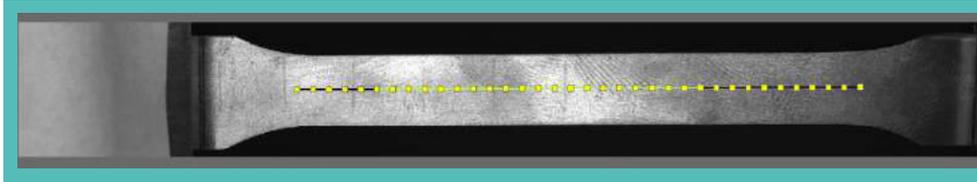
The X-Sight Optical Extensometer Software Kit is a versatile solution that empowers you to build your own video extensometer using custom hardware components. This kit provides the flexibility to integrate your choice of cameras, lighting, and other equipment, making it ideal for creating a tailored material testing setup. It delivers precise axial strain measurement and can be easily upgraded for advanced testing needs such as transverse, torsion, crack analysis, 3D, post-processing, and Digital Image Correlation (DIC).

datasheet



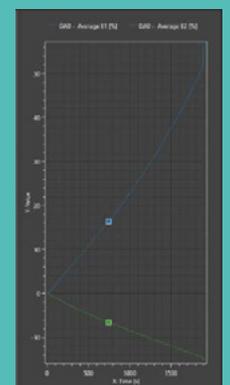
OPTICAL EXTENSOMETER SOFTWARE KIT

All X-Sight optical extensometers are equipped with state-of-the-art digital correlation (DIC) technology, ensuring precise and accurate strain measurements in real-time. Our user-friendly Alpha DIC software adopts a modular approach, providing intuitive ergonomics suitable for both advanced research and routine measurements. Software operates as a sensor with real-time output of measurement values to various UTM machines and other data acquisition systems.



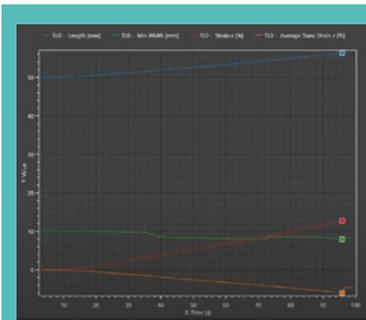
**BASIC FUNCTIONALITY**

Get the most with post-process functions that boasts a multitude of industry-leading software features, making it a versatile and exceptional choice for a wide range of applications, such as tensile, compressive, bending, shear, torsional, and fatigue testing.



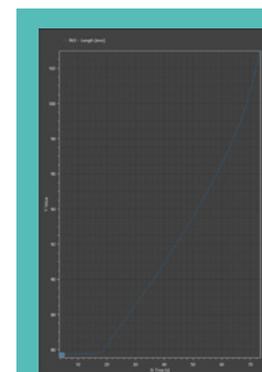
**ADVANCED FUNCTIONALITY**

In materials testing, the tensile test is one of the most fundamental methods. Trans line clearly shows where necking occurs and the specimen eventually fractures.



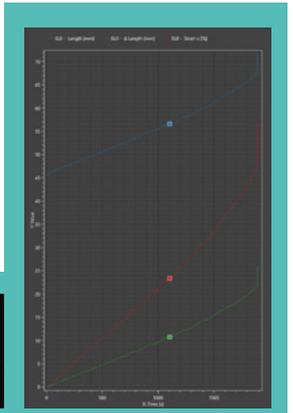
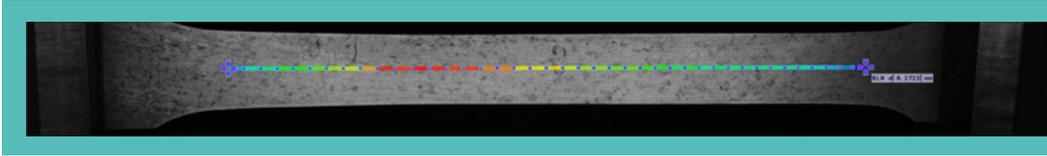
**NECK DETECTION**

Testing of concrete-reinforcing steel: The unique ITT functionality of X-Sight's DIC software allows for the measurement of specimens with an oxide or rust layer falling off significantly.



**REBAR TESTING**

Line Value Distribution provides a colorful visualization of different value types when using probes based on segmented lines.



LINE VALUE DISTRIBUTION

Inquiry form



FoV calculator



# X<sup>S</sup>SIGHT

