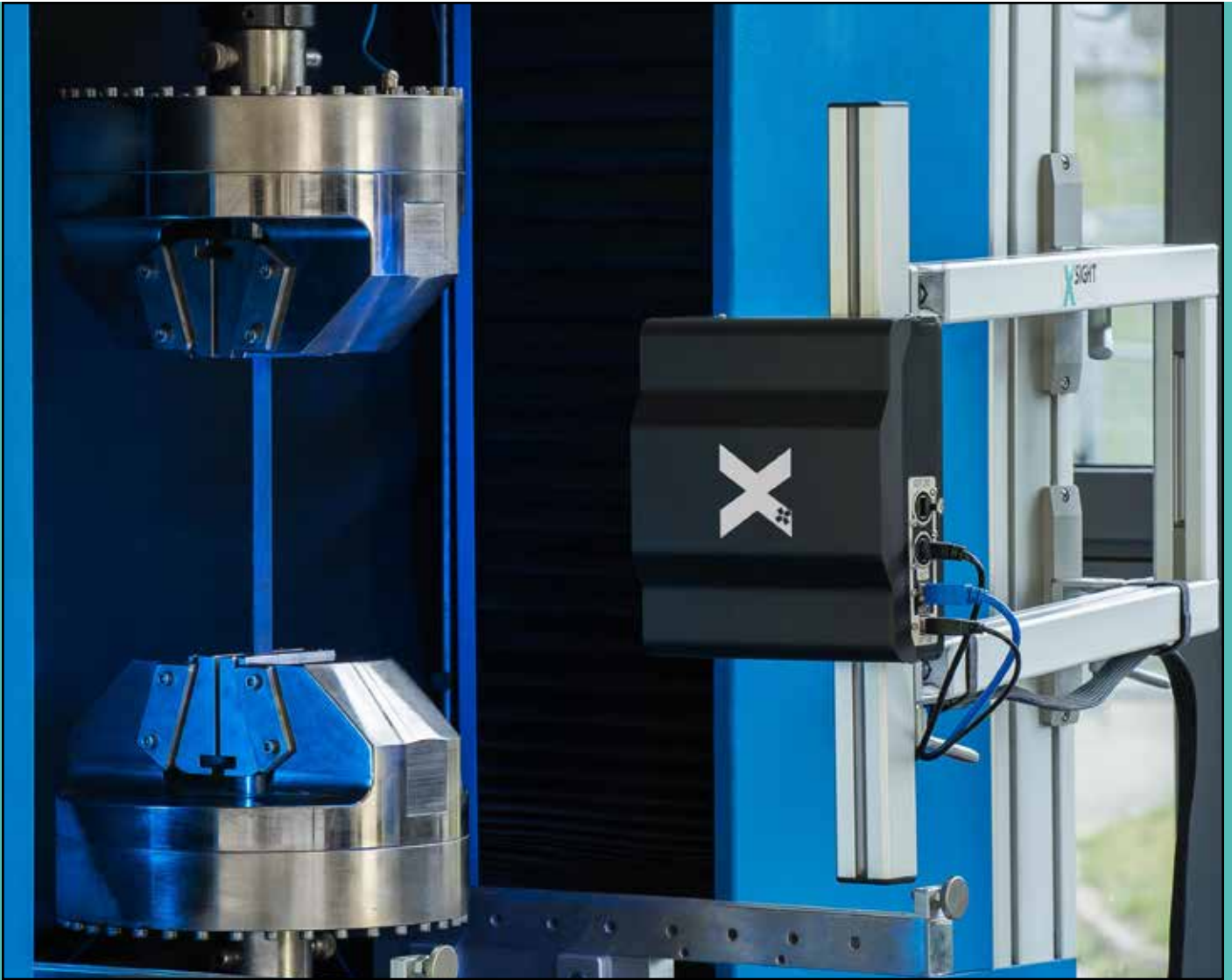




# OPTICAL EXTENSOMETERS



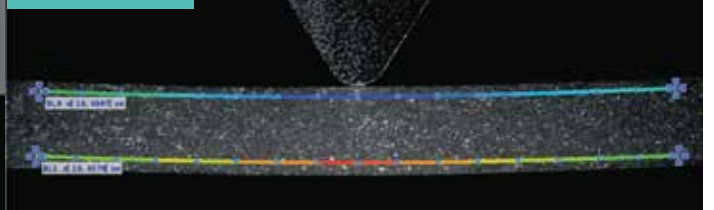
EXTENSOMETRY &  
STRAIN ANALYSIS



TENSILE TESTING



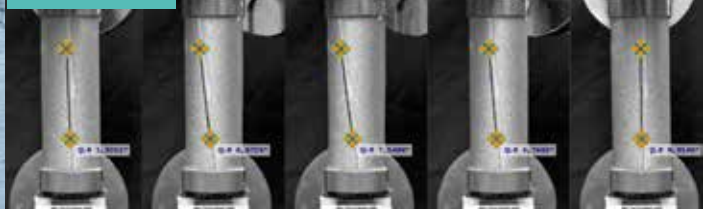
FLEXURAL TESTING



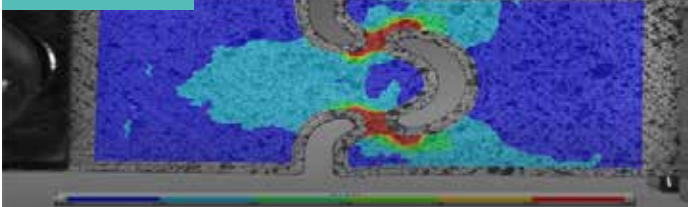
BIAXIAL TESTING



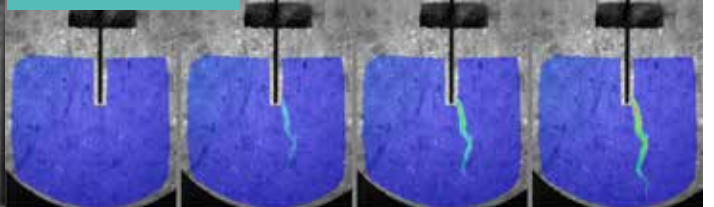
TORSION TESTING



SHEAR TESTING



CRACK PROPAGATION



## 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 (02,05,06,09,16)
- Number of Camera Units (1-3)
- Model Series Designation

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

- Dual Camera, 3D setup
- Mpx Resolution (02,05,06,09,16)
- 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.



### A UNIVERSAL STANDARD YOU CAN RELY ON IN EVERY TEST LAB

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.

2000 series 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
- ▶ 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



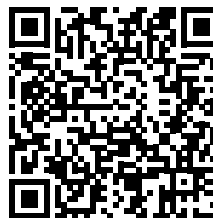
Product	Typical sampling rate [Hz]	Sampling rate at full view [Hz]	Measurement length [mm]	
			Class 0.5	Class 1
X-Sight-2101	200	170	80	160
X-Sight-2102	90	43	110	190
X-Sight-2105	175	75	130	260
X-Sight-2106*	200	60	-	-
X-Sight-2109	75	32	220	440
X-Sight-2116	70	23	330	660
X-Sight-2201	200	170	2 × 80	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 OE

Product	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)

2106 (ASTM) datasheet



2000 series video



### BEYOND STANDARD MEASUREMENT RANGES

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.

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

4000 series datasheet



4000-D series datasheet



4000-D series video



### 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



Product	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-4106**	200	60		
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-4106-D**	200	60		
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

\* Compliant to ISO 9513 \*\* ASTM focused OE  
More configurations available upon request

Product	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)

**X-SIGHT-41<sub>xx</sub>**  
xx = 01, 02,  
05, 06, 09 and 16



**X-SIGHT-41<sub>xx</sub>-D**  
xx = 01, 02,  
05, 06, 09 and 16



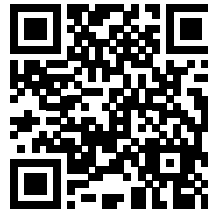
**X-SIGHT-42<sub>xx</sub>**  
xx = 01, 02,  
05, 09 and 16



### FOR TRUE 3D DEFORMATION MEASUREMENT

The X-Sight 4000-3D Series is a universal stereoscopic optical extensometer (3DOE) 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 3DOE 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.

4000-3D video



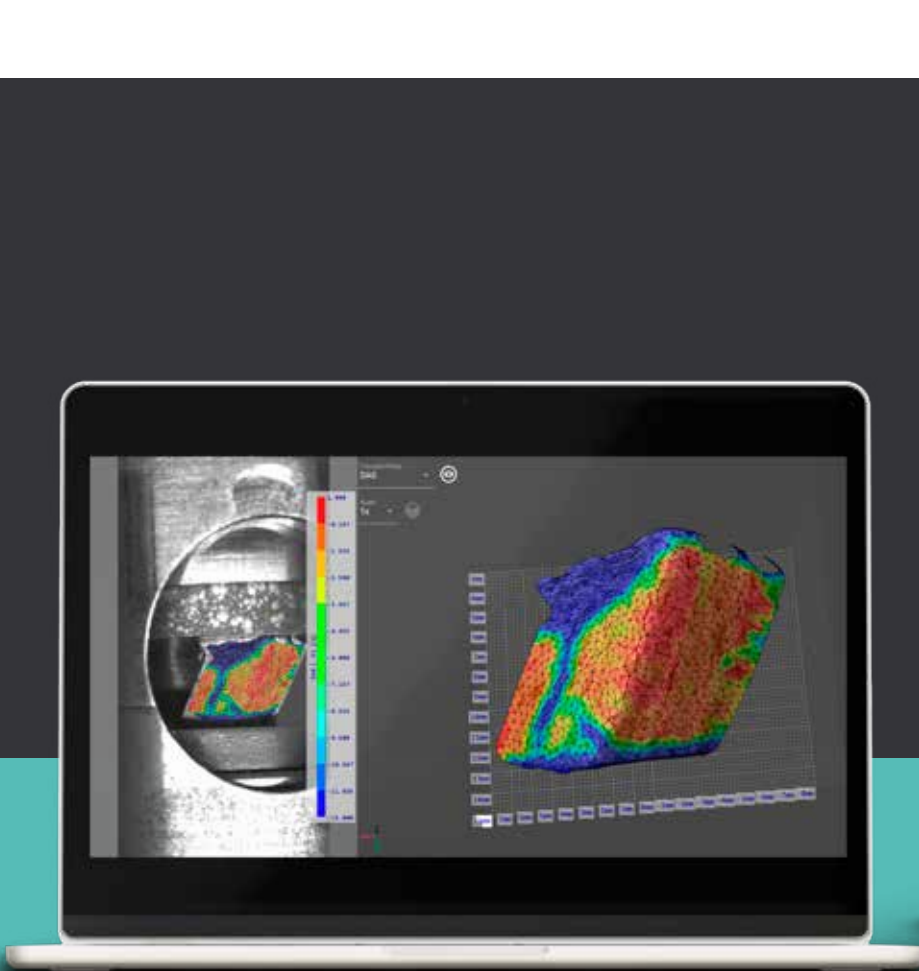
4000-3D datasheet



Product	Typical sampling rate [Hz]	Sampling rate at fullview [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

Product	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)



### DESIGNED FOR EFFORTLESS MEASUREMENT

X-Sight SWIFT is our newest approach to reducing the need for human interaction with the measurement device. While the measurement itself still runs on the high-precision digital image correlation algorithm, virtual probe positioning is performed using mark recognition.

Mark detection allows the SWIFT 3D to automatically detect the gauge length and the specimen diameter/thickness; therefore, there is no need to enter or transfer this information.

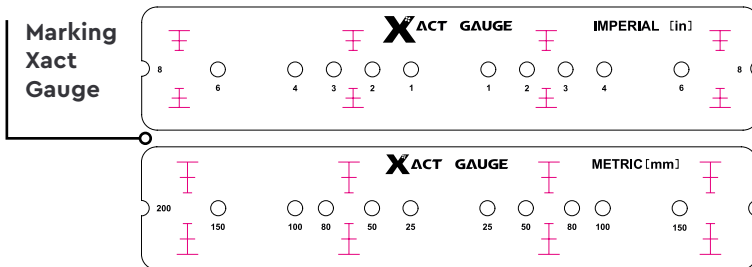
Swift 3D datasheet



Product	Typical sampling rate [Hz]	Sampling rate at fullview [Hz]	Measurement length				Working distance [mm]
			Class 0.5*	Class 1*	Class B-1** (GL > 0.4 in)	Class B-1** (GL > 0.8 in)	
Swift 3D	150	60	140 mm	280 mm	5,5 "	11 "	310

\* Compliant to ISO 9513

\*\* Compliant to ASTM E83



POSITION



MARK



MEASURE



### FOR RELIABLE TESTING OF REINFORCING STEEL, EVEN WITH CHALLENGING SURFACES

The X-Sight ROD system is a specialized optical extensometer designed for tensile testing of reinforcing steel bars in accordance with ISO Class 1 requirements. It is optimized for real testing conditions where surface scale or oxide layers may detach during deformation, causing standard optical extensometers to become unreliable.

Using the unique ITT functionality of X-Sight's DIC software, ROD delivers stable and precise strain measurement even when the specimen surface changes during the test. This makes the system well suited for routine and certification testing of reinforcing steel in both industrial and laboratory environments.

In addition to yield and tensile strength evaluation, the accurate strain data provided by ROD also enables reliable determination of the Modulus of Elasticity (E-modulus) directly from the elastic region of the stress-strain curve.

Product	Typical sampling rate [Hz]	Sampling rate at full view [Hz]	Interface	Measurement length [mm]	Light	Dimensions [mm]	Weight [kg]	Lens mount
				Class 1*				
X-Sight-ROD	200	60	USB 3.0	550	L400	421×187×80	2.6	C

\* Compliant to ISO 9513



### DESIGNED FOR HIGH-TEMPERATURE TESTING APPLICATIONS

HT Series is a range of optical extensometers designed for high-temperature testing applications. The systems enable precise strain measurement at temperatures up to 1800 °C and are intended for advanced thermomechanical and thermophysical testing.

The HT Series combines high-precision measurement with a user-friendly graphical interface, allowing users to fully focus on uniaxial or biaxial tensile, compression, and shear testing under extreme temperature conditions.

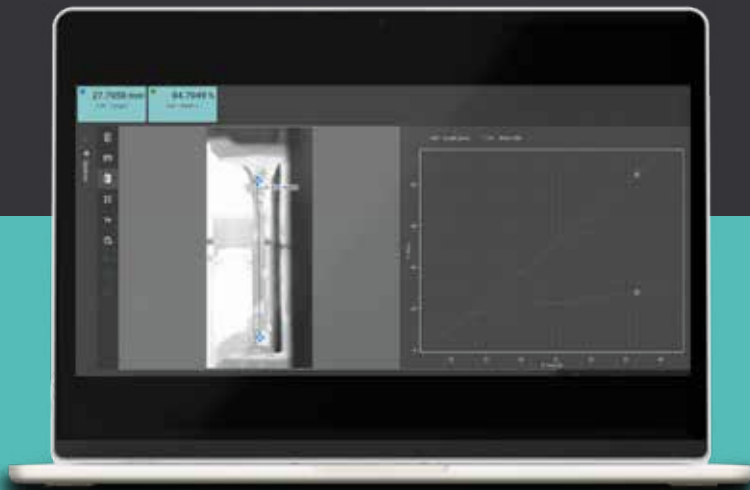
HT datasheet



Product	Resolution [MPx]	Frame rate @ full resolution [Hz]	Interface	Resolution [ $\mu\text{m}$ ]*	Measurement length [mm]	Working distance [mm]	Light	Dimensions [mm]	Lens type	Weight [kg]
HT	5.0	75	USB 3.0	<0.5	47	262 $\pm$ 1%	SLG-N	248x140x76	Telecentric	1.7
HITEX**	1.3	170	USB 3.0	<0.5	45	125 $\pm$ 1%	Laser	253x136x71	Telecentric	1.7

\* At room temperature. Resolution at elevated temperature is highly affected by boundary conditions (vibrations, air turbulence).

\*\* The HITEX model was developed as part of a project supported by the Technology Agency of the Czech Republic (TACR) under the TREND Programme.



## HIGH-PRECISION MEASUREMENT FOR SMALL AND DEMANDING SPECIMENS

The X-Sight ST is a compact, semi-telecentric optical extensometer engineered for high-precision strain and displacement measurements on small specimens. Its adjustable semi-telecentric optics provide exceptional measurement stability while allowing the field of view and working distance to be tailored to the application.

A high-resolution industrial camera, low-distortion optical path and monochromatic green illumination produce clean, high-contrast images with micron-level accuracy. An integrated bandpass filter suppresses unwanted wavelengths and specimen glow, making the ST suitable for high-temperature measurements up to 1800 °C.

ST datasheet



Product	Resolution [MPx]	Frame rate @ full resolution [Hz]	Interface	Light	Weight [kg]	Lens type
ST	5.0	75	USB 3.0	SLG-N	0.9	Semi-telecentric

WD [mm]	Mag [x]	Field of View [mm]	
		Axial	Trans
1000	0.057	148	124
800	0.072	117	98
600	0.097	87	73
400	0.15	56	47
200	0.323	26	22
140	0.504	17	14



### YOUR HARDWARE, OUR EXTENSOMETRY KNOW-HOW

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).

Software kit datasheet



LINE-BASED PROBES



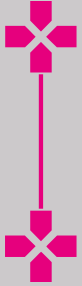
**Point**

A basic measuring probe for displacement determination.



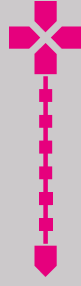
**Anchor point**

Allows to isolate displacements of other probes



**Line**

An elementary measuring probe for strain and length determination.



**Extreme Line**

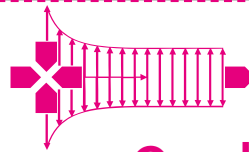
Advanced probe for axial neck detection, provides an improved E-modulus reading.

TYPICALLY INCLUDED



**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.



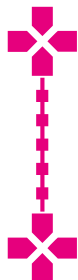
**Crack Probe**

Measures a crack length during static or dynamic tests.



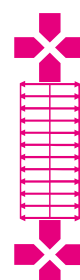
**Torsion Line**

Enables dual position angular twist and strain measurement.



**ROD Line**

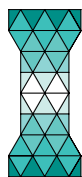
Advanced line measurement probe with axial neck detection feature for samples with oxide or rust layer.



**Trans Line**

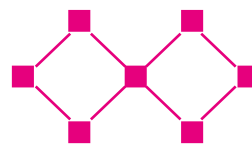
Used for multi-positional transversal measurement with averaged and min/max width functions.

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.



**Net Probe**

An advanced tool for complex strain measurement and visualization of wireframe components and beam structures.

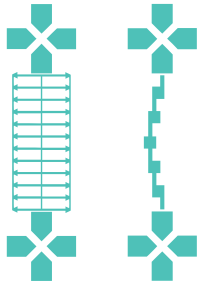
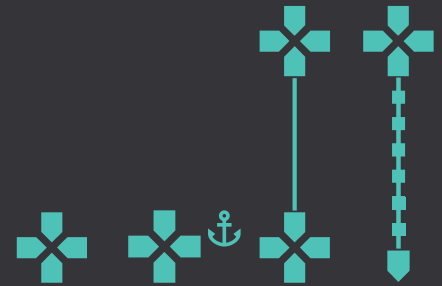
Software Module	Point	Anchor Point	Line	Extreme Line	Trans Line	Bend Line	Torsion Line	Crack Probe	Net Probe	ROD Line	DIC Area
AX/AX3D	•	•	•	•							
TR*					•	•					
TO*							•				
CL*								•			
NP*									•		
IIT*										•	
DIC*											•
PP*	Post-processing of recorded measurements (different probes or layouts)										
DI*	Possibility to input auxiliary signals (digital and analog)										
LVD*	Color value distribution along Extreme, ROD, or Bend Line										

\* Additional software module

## AX/AX3D - 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 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.

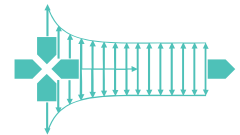


## TO - TORSIONAL

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

## CL - CRACK LENGTH

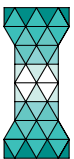
This module is designed for crack length measurement of compact tension (CT) or double cantilever beam (DCB) specimens. Line probe function is included in the CL module. Line probe enables crack opening measurement providing results comparable to conventional devices.



## 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.

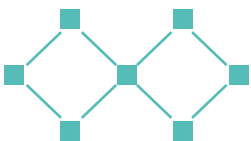
## LVD - LINE VALUE DISTRIBUTION

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.



## NP - NET PROBE

Enables advanced strain measurement using the Net Probe, a mesh of interconnected measurement points. This configuration allows effective analysis and visualization of complex deformation in wireframe components, lattice structures, and beam-based constructions, where conventional point or line probes are insufficient.



## 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.





### RELAY

For automated switching (lights)



### SYNCHRON

For camera synchronization



### PULSEGEN

For incremental encoder emulation



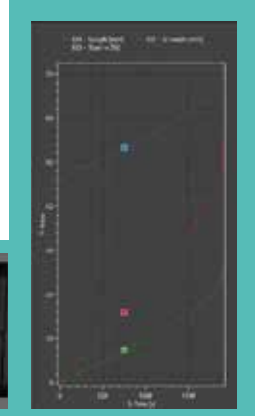
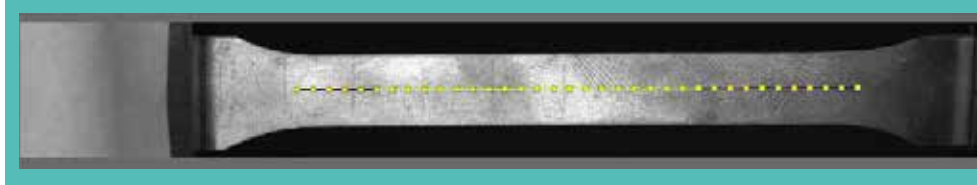
### ALPHA DECK

For easy manual operation



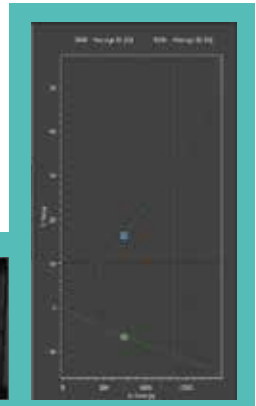
AND MORE

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.



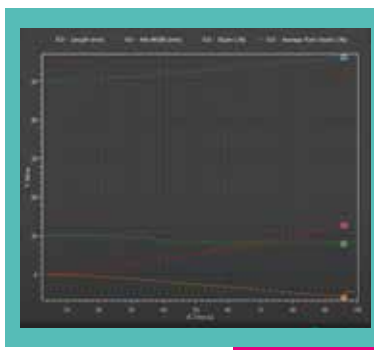
**BASIC FUNCTIONALITY**

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.



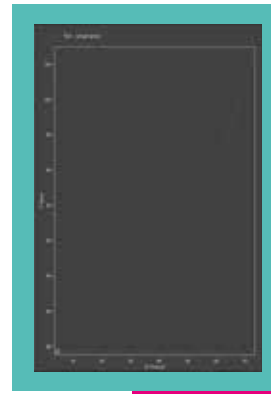
**ADVANCED FUNCTIONALITY**

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.



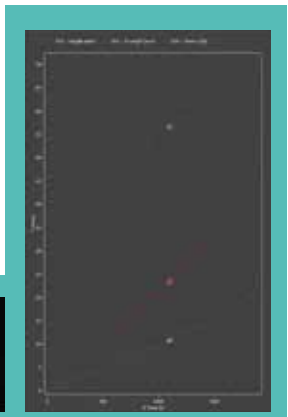
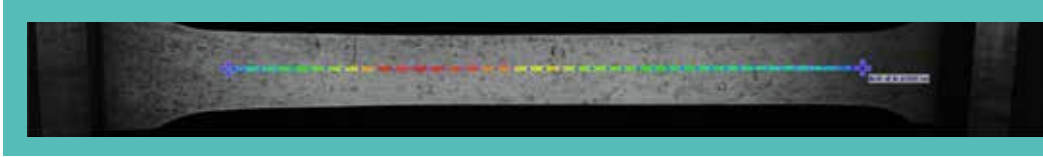
**NECK DETECTION**

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 SIGHT



Updated 1/2026