



X-SIGHT ROD

Reinforcing Steel Bars Optical
Extensometer

FEATURES

- All-in-one box extensometer
- For reinforcing steel testing
- For up to 550 measuring length
- Stackable for joined fields of view
- Axial neck detection

SOFTWARE

- X-Sight Alpha DIC®
- Axial software module included
- Intelligent Tensile Testing module included
- Additional advanced features

SUPPORTED OPERATING SYSTEMS

- Win 11 64bit / Win 10 64bit
- Win Server 2019 / Win Server 2022

Latest Release on date of purchase



▲ X-Sight ROD OE comes with two cameras, two lenses, light, and calibrating grid.

**SPECIALIZED OPTICAL EXTENSOMETER FOR
REINFORCING STEEL AND DETACHING SURFACE
LAYERS.**

OVERVIEW

The X-Sight ROD is a specialized optical extensometer (OE) designed primarily for tensile testing of reinforcing steel bars and other specimens with surface layers, such as oxide or rust, which may crack and detach during testing. Its dedicated ROD Line measurement tool compensates for the detachment of the surface layer and includes axial neck detection for reliable strain measurement throughout the test.

The system is equipped with two cameras to provide an extended field of view, making it also suitable for longer specimens and applications involving large elongations.

The X-Sight ROD provides multiple values simultaneously, so measurement at different positions or with different gauge lengths is possible.

It accurately measures strain, total length, delta length, angle, and much more.

MEASURING LENGTH

A lens and a working distance selection modify each model's measuring length.

In practice, the required accuracy class that dictates the strain or elongation resolution gives the maximal measuring length.

Model Designation	Measuring Length at Class 0.5 [mm]	Measuring Length at Class 1 [mm]*
X-Sight-ROD	300/2x160	550/2x280

*External light might be needed

SAMPLING RATE

The camera resolution and 5Gbps data throughput of the USB 3.0 bus give the default sampling rate.

Sampling Rate at Full View [Hz]	Typical Sampling Rate [Hz]
60	200

The sampling rate can be raised up to 500 Hz by reducing the width of the camera view, which is, in most cases, not used.

WORKING DISTANCE

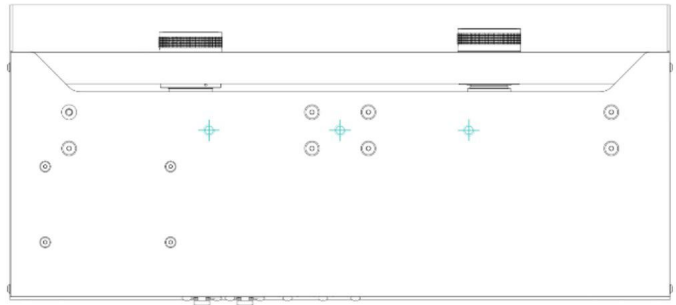
As already outlined, the working distance is in a triangle selection together with a measuring length and lens focal length. By selecting two of these values, the third becomes driven. A typical working distance for the X-Sight ROD extensometer is **250–400 mm**, measured from the front cover edge. This range can be extended on demand.

Be aware that positioning the OE unit at a longer distance reduces the LED light intensity and may eventually increase the shutter time needed to obtain bright images and reduce the sampling rate.

Check the Working Distances page of this datasheet to learn more about the distances for typical camera/lens combinations.

MECHANICAL INTERFACE

The OE unit can be mounted via a **1/4" UNC** threaded hole in the middle of the bottom plate to a tripod head for portable use. However, a common way of mounting the OE to a UTM is using two **M6** screw holes with a **165 mm** vertical span securing the system in a fixed position.



▲The bottom plate of the X-Sight-ROD - 1/4" UNC in the middle and M6 screw holes

MECHANICAL DIMENSIONS

The following table includes the mechanical dimensions for each OE unit.

Dimension	Value
Length	424 mm
Width	187 mm
Height	80 mm
Weight	2.6 kg

LIGHT PARAMETERS

Each X-Sight-ROD unit is equipped with a bar LED light.

Parameter	Value
Active Length	400 mm
Wavelength	465 nm
Luminous Flux	330 lumens
Power	16 W

PC CONNECTION

The OE is connected to the PC using one USB 3.0 cable for each camera unit and one USB 2.0 cable for relay operation (if present). **The standard cable length is 3m.** All cables can be extended using Active Optical Cables.

A USB 3.0 extension card to the PCIe slot supplied by X-Sight is recommended to secure a stable camera connection, as some integrated USB 3.0 ports may lack appropriate bandwidth.

DATA TRANSFER

Multiple ways exist to **OUTPUT** the measured data to the machine control unit or the testing machine software.

• DIGITAL

DOLI Binary, MODBUS, HP VIDEO, TCP/IP, RS232

• API

Alpha API (JSON), MRT API

• ANALOG

Auxiliary AD/DA converters

• PULSE

quadrature encoder-like pulse communication with the use of a PULSEGEN device.

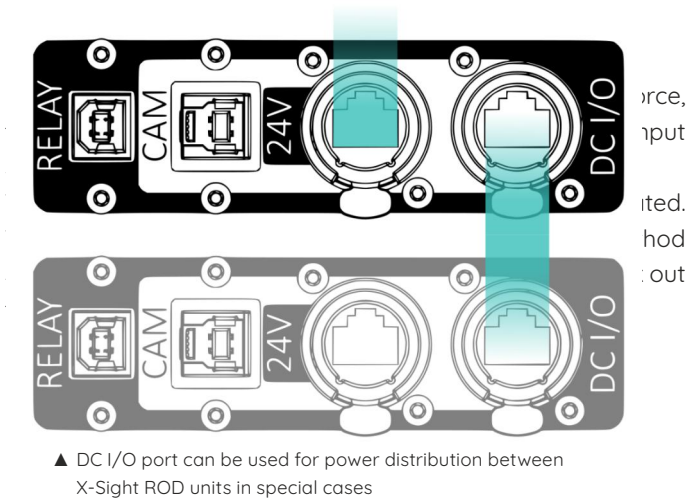
POWER CONNECTION

An ethernet PoE cable provides power for OE unit. This cable is connected to a 24 V marked RJ45 port on the back side of OE unit.

An 802.3.af Mode B PoE standard is used to power the X-Sight-ROD unit.

Pin	Connection
4 & 5	DC+ (24V)
7 & 8	DC- (GND)

When using multiple cameras, the power can be distributed via the DC I/O ports in the following serial manner:



The DC I/O port can be used as an alternative power **INPUT**. In such a case, the power is distributed directly to the LED light, bypassing the USB relay.

The DC I/O port as a power **OUTPUT** provides the 24 V DC voltage only when the USB relay is switched ON. A typical use of DC output is the powering of an auxiliary light.

POWER CONSUMPTION

Each OE unit has the following power consumption.

Dimension	Value
Camera	6 W
USB relay	1 W
L400 LED Light	16 W
SUM	23 W

The cameras and the relay are powered via the USB bus.

OPERATION CONDITIONS

The X-Sight ROD unit is designed for indoor use only. Do not allow the unit to get wet.

Conditions	Permissible value
Temperature	5–40 °C
Humidity	30–70 %

X-Sight ROD allows measurement through the glass or the use of a mirror. In such cases, these optical elements must be highly optical so as not to introduce unwanted disturbance to the measurement.

When measuring through the glass, a polarization set may be required to reduce/eliminate the light reflections.

When measuring with a climatic chamber, be aware that the vibrations and heat turbulence may introduce a raised noise base to your signal.

This equipment is compatible with Class A of CISPR 32. In a residential environment, this equipment may cause radio interference.

This product complies with EU Directive 2002/96/EC and FCC regulations.



PACKAGE CONTENTS

Each OE unit has two lenses of a specified focal length (upon request), 400 mm blue LED light, and an internal USB relay.

Each system contains one calibration grid of size adequate to a desired application. The X-Sight ROD system include JOINED grid to allow stitching of the camera views.

Item	No. of pieces
OE unit	1
Cable Harness	1
Power Supply	1
Calibration Grid	1
Installation USB	1
USB License Key	1

ALPHA DIC SOFTWARE

X-Sight ROD runs on the X-Sight Alpha DIC software to deliver high-quality measurement results while providing straightforward user experience.

MODULARITY AND PROBES

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

The OE typically includes an **AXIAL software module (AX)** and **Intelligent Tensile Tesing (ITT)**.

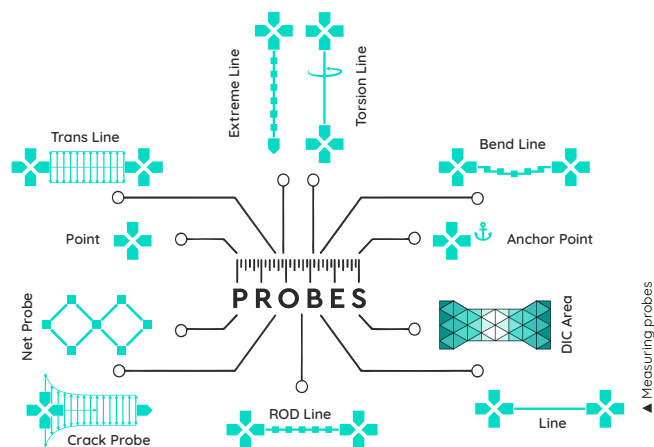
The measurements with OE are primarily performed in real-time using line-based measuring probes with online data transfer to the testing machine.

However, to get the most out of an optical strain measuring device, there is an option to add a post-processing feature. In post-processing, the number of line-based probes can be multiplied or switched to an area strain or displacement mapping function.

LICENSING

X-Sight ROD has a perpetual X-Sight Alpha DIC software license bonded to an HW USB dongle. This allows the user to install the software on unlimited computers and use only the one where the license key is plugged in. This way of licensing makes it easy to switch the computer in case of a PC breakdown.

Alternatively, a network license is available upon request, which allows the software to be used on multiple devices within the same network without the need for physical key transfers.



SW Module	Point	Anchor	Line	Extreme Line	Trans Line	Bend Line	Torsion Line	Crack Probe	ROD Line	Net Probe	DIC Area
AX	•	•	•	•							
TR*					•	•					
TO*							•				
CR*								•			
ITT									•		
NP*										•	
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										
FLC**	Evaluation of Forming Limit Curves										
3D	3D DIC Stereoscopic Module										

* Expansion software module requires the presence of AX

**Available only for 3D setups

FIELDS OF VIEWS & WORKING DISTANCES

The following tables show the relationship between system's camera resolution, lens focal length, and working distance.

X-Sight-ROD						
ISO 9513 class	Field of View [mm]		Working Distance [mm]			
			Lens Focal Length [mm]			
	Height	Width	8	12	16	25
0.5	300/2×160	100	167	265	354	581*
1	550/2×280	183	334	512*	685*	1088*

* An additional light might be needed

SYSTEM REQUIREMENTS

System requirements	System requirements Recommended
CPU	Intel/AMD 2GHz 2-core (>3000 points - Average CPU Mark *) Intel/AMD 4GHz >8-core (>4000 points - Single Thread Rating **)
GPU	NVidia/AMD/Intel OpenGL 3.0 1024×768px (>300 points ***) NVidia/AMD/Intel OpenGL 3.0 1920×1200px (>5000 points ****)
Memory	4GB 16GB DDR4
Disk	8GB HDD free 1TB SSD / M.2
Ports	1× USB (HW key), 1×USB 3.0 for each camera (2 in total) + 1× USB 2.0; (Optional) 1× USB for peripheral data transfer device (Optional) 1× Ethernet Port of MODBUS or TCP/IP communication
Operating System	Windows 11 64-bit ***** or Windows 10 64-bit ***** Windows Server 2019 ***** or Windows Server 2022 *****

* MID CPU BENCHMARK www.cpubenchmark.net

** HIGH-END CPU BENCHMARK www.cpubenchmark.net

*** MIDLOW GPU BENCHMARK www.videocardbenchmark.net

**** HIGH-END GPU BENCHMARK www.videocardbenchmark.net

***** Latest Release on date of purchase