



X-SIGHT HT SERIES

High Temperature Extensometer

FEATURES

- Tests at ambient temperature, in temperature chambers, and furnaces
- Capable of low-frequency cycling test measurement
- Possibility of strain-controlled tests
- High resolution telecentric lens

SOFTWARE

- X-Sight Alpha DIC®
- Tensile (axial), compression, shear, bending and torsional tests
- Recording and post-process option
- 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 HT VE comes with a camera, lens, light, built-in USB relay, grid and calibration grid.

THE HT IS A PROFESSIONAL OPTICAL EXTENSOMETER OPTIMIZED FOR HIGH-TEMPERATURE APPLICATIONS, ACCURATELY FUNCTIONING IN ENVIRONMENTS FROM AMBIENT UP TO 1800°C.

OVERVIEW

The HT is a professional optical extensometer optimized for high-temperature applications, accurately functioning in environments from ambient up to 1800°C.

The system features a high-resolution, low-distortion telecentric lens, ensuring precise and consistent measurements. The telecentric design minimizes out of plane movement and maintains uniform magnification across the field of view. This lens is paired with a high-resolution industrial-grade digital camera, capable of capturing detailed images with exceptional clarity.

Equipped with UV and IR filters, the lens effectively cuts out unwanted parts of the light spectrum, enhancing the accuracy of measurements. Additionally, the system includes an integrated monochromatic green LED light, with automatic light operation. This feature ensures optimal illumination, crucial for high-precision measurements.

The front face of the system is protected by an optical-grade, high-temperature resistant quartz glass shield. This shield safeguards the internal components from high-temperature exposure, ensuring long-term reliability. For advanced applications, the system offers the option of external camera triggering. This capability allows synchronization with other devices and systems, enhancing versatility.

To maintain performance in high-temperature environments, the system incorporates an active cooling mechanism. This ensures stable operation and protects sensitive components from heat damage. The system is designed to meet the rigorous demands of various high-temperature testing environments, including material testing and low-frequency cycling tests.

MEASURING LENGTH

Unlike classic endocentric lenses, where the field of view can be adjusted by choosing the focal length, the field of view of a telecentric lens depends on the configuration and magnification of its optical elements. This unique characteristic ensures that the size of images produced by a telecentric lens remains consistent regardless of the distance between the image plane and the lens making them ideal for precision optical measurements.

The maximum measurement length of this system is 46 mm. From these parameters, the resolution can then be determined, corresponding to Class 0.5.

Model Designation	Measuring Length [mm]	Resolution [μm]*
X-Sight-HT	46	<0,5

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

SAMPLING RATE

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

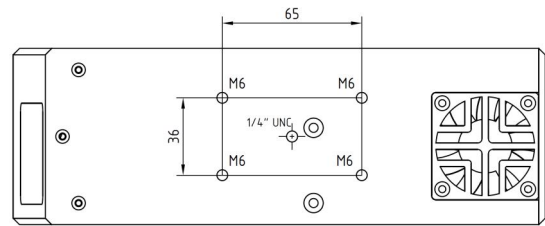
Model Designation	Sampling Rate at Full View [Hz]	Typical Sampling Rate [Hz]
X-Sight-HT	75	175

WORKING DISTANCE

As already outlined, the images produced by a telecentric lens are insensitive to the distance between the image plane and the lens. That being said, the lens itself has a predefined working distance at which it maintains its telecentric properties with a tolerance of a few percent of the nominal value. Based on the used lens, the ideal working distance of this system is **262 mm**.

MECHANICAL INTERFACE

The HT 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 HT to a UTM is by using for **M6** screw holes and our profile adapter (sold separately).



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

MECHANICAL DIMENSIONS

The following table includes the mechanical dimensions of a HT unit.

Dimension	Value
Length	248 mm
Width	82 mm
Height	140 mm
Weight	2.3 kg

LIGHT PARAMETERS

HT unit is equipped with a green high power spotlight.

Parameter	Value
Beam angle	13°
Wavelength	523 nm
Luminous Flux	580 lumens
Power	9 W

PC CONNECTION

The HT is connected to the PC using one USB 3.0 cable for the camera and one USB 2.0 cable for relay operation. The standard cable length is **3 m**. 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

INPUT of external data to X-Sight Alpha software (force, temperature, pressure) is also possible (requires Device Input software module - DI).

The API communication allows the VE to be remotely operated. This feature includes commands like START/STOP, Method Switch, Set Gauge Length, and others. For more info, check out the **Communication Options** document.

POWER CONNECTION

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

An 802.3.af Mode B PoE standard is used to power the HT unit.

Power supply is not part of the system.

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

POWER CONSUMPTION

The power consumption of each component of the HT unit goes as follows:

Dimension	Value
Camera	3 W
USB relay	1 W
LED Spotlight	9 W
SUM	13 W

Cameras and the relay are powered via the USB bus.

MEASUREMENT CONDITIONS

To achieve the best measurement results, we recommend following our guidelines for optimal measurement conditions.

Hot air turbulence in front of the furnace can significantly impact the overall image quality and should be avoided. This can be mitigated by using a tunnel between the lens and the furnace or by employing a fan to redirect the airflow.

Another potential source of disturbance is the tilt of the furnace window, which may cause reflections captured by the camera, thereby affecting the measurement accuracy. It is advisable to consider this factor and position the lighting accordingly.

OPERATION CONDITIONS

The HT unit is designed for indoor use only. Do not allow the device to get wet.

Item	No. of pieces
Temperature	10-30 °C
Humidity	30-70 %

The HT allows measurement through the glass or with the use of a mirror. In such cases, these optical elements must be of high optical quality so as not to introduce unwanted disturbance to the measurement.

When measuring with a climatic chamber, the vibrations and heat turbulence may introduce a raised noise base to your signal. For this purpose, the HT unit uses a UV an IR filter to minimize the influence of these disturbances on the measurement.

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.



PACKAGE CONTENTS

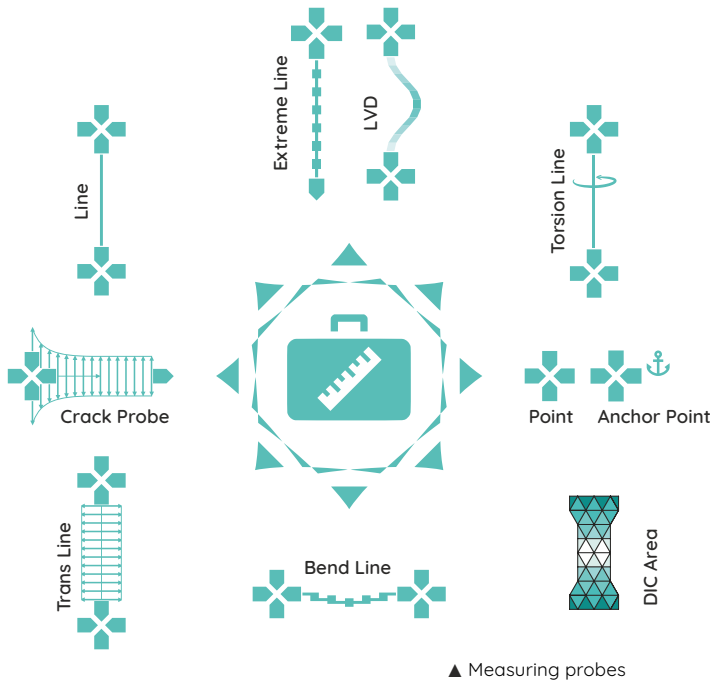
The HT unit has one telecentric lens, green LED high power spotlight, and an internal USB relay.

Each system contains one calibration grid of size adequate to a desired application.

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

The X-Sight HT optical extensometer runs on the X-Sight Alpha DIC software, delivering high-quality measurement results while providing a straightforward user experience.

MODULARITY AND PROBES



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

The measurements with HT 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 for an area strain or displacement mapping function.

LICENSING

The X-Sight optical extensometers have a perpetual X-Sight Alpha DIC software license bonded to a 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.

Software Module	Point	Line	Extreme Line	Trans Line	Bend Line	Torsion Line	Crack Probe	DIC Area
AX	•	•	•					
TR*				•	•			
TO*						•		
CR*							•	
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 or Bend Line							

* Expansion software module requires the presence of AX.

SYSTEM REQUIREMENTS

Parameter	Value - Minimum Recommended
CPU	Intel/AMD 2GHz 2-core (>4000-3D points - Average CPU Mark *) Intel/AMD 4GHz >8-core (>4000 points - Single Thread Rating **)
GPU	NVidia/AMD/Intel OpenGL 3.0 1024x768px (>300 points ***) NVidia/AMD/Intel OpenGL 3.0 1920x1200px (>5000 points ****)
Memory	4GB 16GB DDR4
Disk	8GB HDD free 1TB SSD / M.2
Ports	1x USB (HW key), 1x USB 3.0 for each VE device + 1x USB 2.0 (relay) (Optional) 1xUSB for peripheral data transfer device (Optional) 1xEthernet 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