# X·SIGHT

X-SIGHT 2D DIC

2D DIC OPTICAL MEASURING SYSTEM

X-SIGHT 2D DIC

The Alpha 2D DIC is a straightforward single- or multi-camera device suitable for experimental validation of your designs, calculations, numerical simulations. It is ideal for assessing various mechanical characteristics of your machines, assemblies, and structures.

Equipped with advanced digital image correlation software, Alpha 2D DIC provides precise and accurate real-time strain and deformation measurement and delivers results with nanometric resolution. Software postprocessing allows for comfortable browsing and reassessment of stored data from previous measurements.

X-SIGHT 2D M5
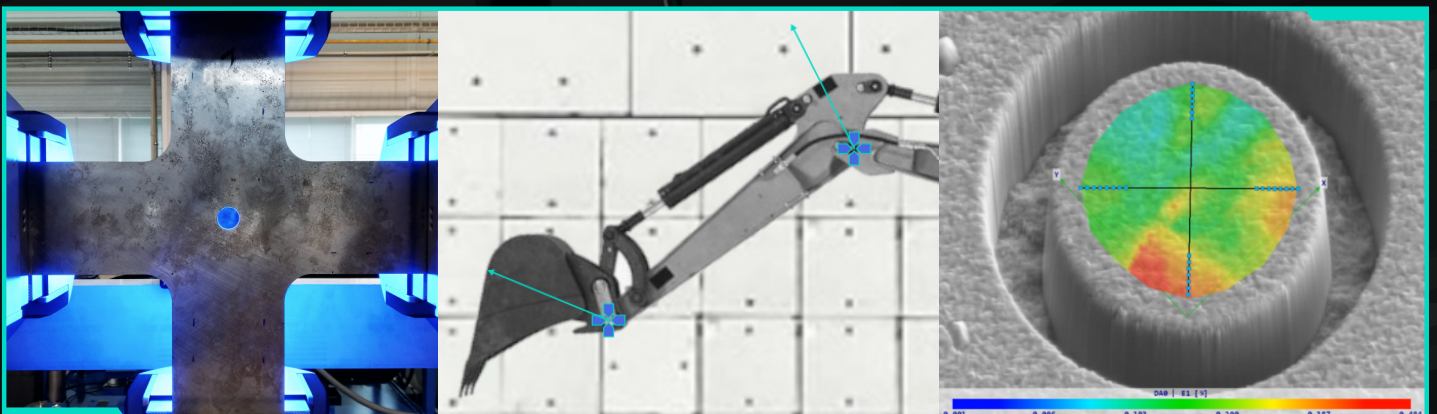
Specification

- Single low-noise camera

- Resolution: 5 MPx (2448 × 2048 Px)

- Frame rate 75 FPS at full resolution

  - > 120 FPS at 2.5 MPx
  - > 300 FPS at 1 MPx
  - max 1 kFPS at 2448 × 128 Px

- Measuring applicable on speckle patterns or natural patterns

- In-Plane subpixel resolution < 0.008% (> 50 GPx resolution equivalent)

- Out-of-Plane movement reduced by special lens type (optional)

- Strain resolution 50 microstrains

  - 10 microstrains with time averaging
  - 5 microstrain in optical extensometer mode

- Strain range from 0.005% to > 2000%

- Measuring area (specimen size) range from 1 mm to 100 m

  - < 5 mm specimen must be measured with a special microscope
  - > 10 m specimen can only be calibrated using the LOCF (Large Object Calibration Function)

Measuring Area Length	10 mm	200 mm	500 mm	1m	4m	10 m	30 m
	0.39 in	7.87 in	19.69 in	3.28 ft	13.12 ft	32.81 ft	98.43 ft
In-Plane Resolution	33 nm	0.65 um	1.63 um	3.3 um	13.1 um	0.03 mm	0.10 mm
	0.001 mils	0.03 mils	0.06 mils	0.13 mils	0.51 mils	1.29 mils	3.86 mils

Note: Time averaging not considered

X-SIGHT 2D M12

Specification

- Single low-noise camera

- Resolution: 12.3 MPx (4096 × 3000 Px)

- Frame rate 23 FPS at full resolution

  - > 40 FPS at 6 MPx
  - > 300 FPS at 1 MPx
  - max 1 kFPS at 4096 × 128 Px

- Measuring applicable on speckle patterns or natural patterns

- In-Plane subpixel resolution < 0.008% (> 122 GPx resolution equivalent)

- Out-of-Plane movement reduced by special lens type (optional)

- Strain resolution 50 microstrains

  - 10 microstrains with time averaging
  - 5 microstrain in optical extensometer mode

- Strain range from 0.005% to > 2000%

- Measuring area (specimen size) range from 1 mm to 100 m

  - < 5 mm specimen must be measured with a special microscope
  - > 10 m specimen can only be calibrated using the LOCF (Large Object Calibration Function)

Measuring Area Length	10 mm	200 mm	**500 mm**	**1m**	**4m**	10 m	30 m
	0.39 in	7.87 in	19.69 in	3.28 ft	13.12 ft	32.81 ft	98.43 ft
In-Plane Resolution	20 nm	0.39 um	**0.98 um**	**2.0 um**	**7.8 um**	0.02 mm	0.06 mm
	0.001 mils	0.02 mils	**0.04 mils**	**0.08 mils**	**0.31 mils**	0.77 mils	2.31 mils

Note: Time averaging not considered

X-SIGHT 2D M24

Specification

- Single low-noise camera

- Resolution: 24.5 MPx (5320 × 4600 Px)

- Frame rate 12 FPS at full resolution

  - > 20 FPS at 12 MPx
  - > 50 FPS at 6 MPx
  - > 300 FPS at 1 MPx
  - max 1 kFPS at 5320 × 96 Px

- Measuring applicable on speckle patterns or natural patterns

- In-Plane subpixel resolution < 0.008% (> 244 GPx resolution equivalent)

- Out-of-Plane movement reduced by special lens type (optional)

- Strain resolution 50 microstrains

  - 10 microstrains with time averaging
  - 5 microstrain in optical extensometer mode

- Strain range from 0.005% to > 2000%

- Measuring area (specimen size) range from 10 mm to 100 m

  - < 10 mm specimen must be measured with a special microscope
  - > 10 m specimen can only be calibrated using the LOCF (Large Object Calibration Function)

Measuring Area Length	10 mm	200 mm	**500 mm**	1m	**4m**	**10 m**	30 m
	0.39 in	7.87 in	19.69 in	3.28 ft	13.12 ft	32.81 ft	98.43 ft
In-Plane Resolution	15 nm	0.30 um	**0.75 um**	1.5 um	**6.0 um**	**0.02 mm**	0.05 mm
	0.001 mils	0.01 mils	**0.03 mils**	0.06 mils	**0.24 mils**	**0.59 mils**	1.78 mils

Note: Time averaging not considered

X SIGHT

ALPHA DIC SW

α

The Alpha strain analysis software is a user interface between the operator and complex digital image correlation (DIC) mathematical operations, which process images acquired by one of our measuring devices.

You will love its simplicity while its advanced features will keep impressing you.

Alpha software is modular, which means that it can serve in any configuration ranging from a lean and uncomplicated uni-axial optical extensometer to an advanced full-field strain mapping analysis post-processor.

Key Features

▶ Method presets linked with a calibration

▶ Simultaneous multi-probe measurement

▶ A wide palette of available outputs

▶ Lockable administrator account

▶ Easily manageable calibrations

▶ Digital image correlation
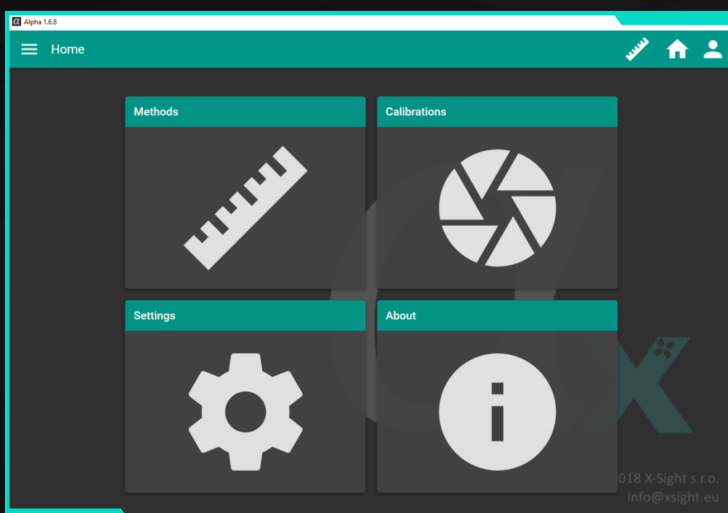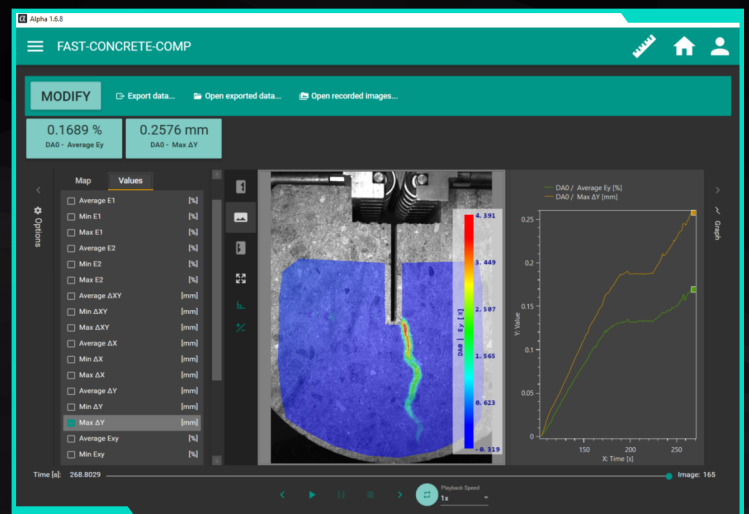
Unique Functions

Incline measurement ◀

Torsion measurement ◀

Transversal edge detection ◀

Crack length measurement ◀

Fragmenting surface measurement ◀

Position averaging for a smooth reading ◀

High-sample-rate real-time strain distribution ◀

ALPHA 3D DIC

Key Features

- Spatial real-time measurement

- Assisted 3D calibration procedure

- Real-time value averaging

- Time to Measured Value charts

- SW optimized for low latency – processing frames at high FPS

- Advanced calibration grid accuracy – easy adjustment for faster calibration

- Multiple stereo camera pair support for extended Field of View

- Stereo camera synchronization supporting multiple camera pairs

- Measurement probes:
    - 3D Point – comparable to 2D Point
    - 3D Line – comparable to 2D Line
    - 3D Area – computation of 3D deformation tensors and their evaluation using statistical functions, surface reconstruction in 3D space

- Data post-processing and playback

- Real-time value output to a multitude of connected A/D devices (D/A converters and other generic binary or digital outputs to 3rd party applications)

- Real-time input of external values (from A/D converters or generic digital inputs transmitting data from testing machine sensors or other devices)

- SW can be fully controlled via API commands and queries

- Post-process features:
    - Computation of recorded data
    - Computed data browsing and evaluation
    - Rendering of color maps showing deformation

- 3D VTK Export (generic export useful for any further data processing and import into CAE (CAD/FEM/CFD) systems such as ANSYS and ParaView

XSIGHT

ALPHA PROBES
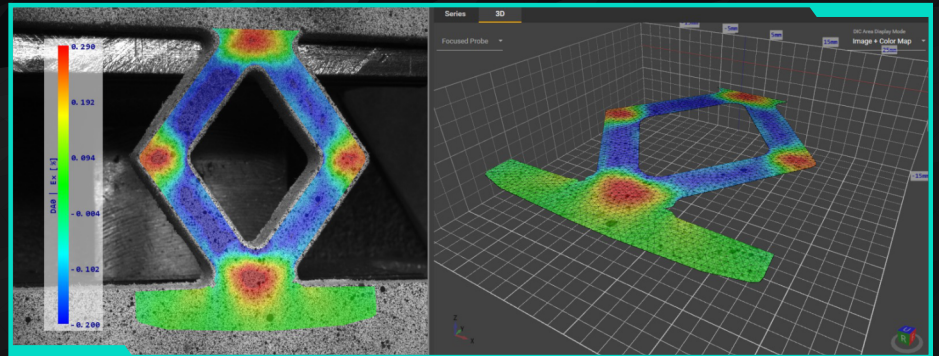
Extreme Line

An advanced probe for axial neck detection. Provides an improved E-modulus reading and minimizes the occurrence of invalid tests caused by rupturing outside the gauge length area.

Line

An elementary measuring probe for strain and length determination.

Torsion Line

Enables dual position angular twist and strain measurement.

Crack Probe

Measures a crack length during static or dynamic tests.

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.
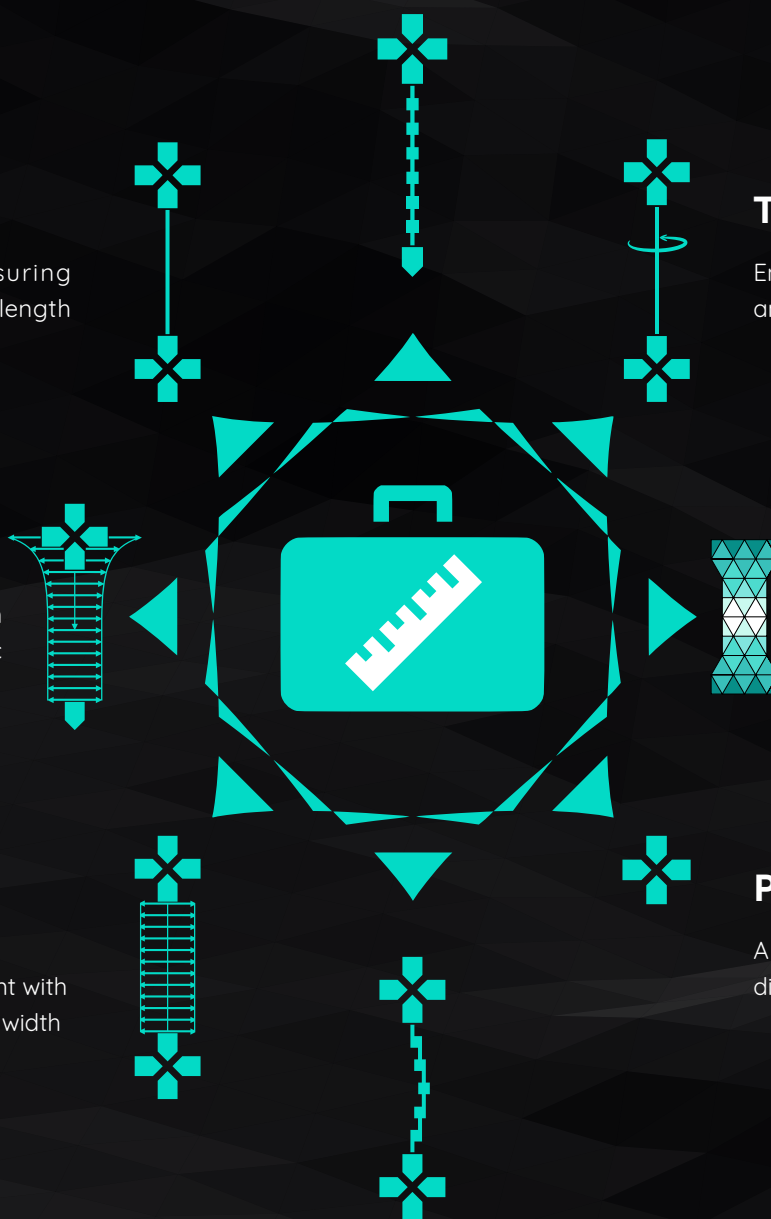
Trans Line

Offers a multi-positional transversal measurement with averaged and max/min width functions.

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.

ALPHA MODULES

A – 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.
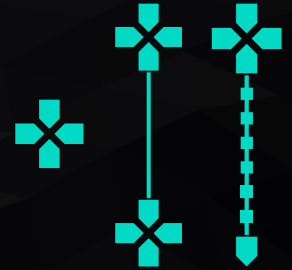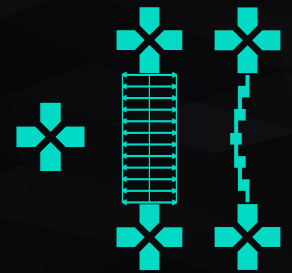
T – Transversal Strain

Allows for measuring of transversal strain in real-time. In addition to the elementary measurement probes such as Point probe and Line probe, the Alpha Transversal Strain measurement module includes the Trans Line probe with the edge detection feature.

The Trans Line offers single or multiple line width measurement. This is an advantage over the conventional single-position measurement. All lines can be averaged for a precise Poisson's ratio reading.

The transversal module does not support axial strain measurement.

AT – Axial & Transversal Strain

A bundle of Axial and Transversal modules.

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.

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.

TR – Torsional

Allows for measurement of angular twist on cylindrical specimens in two positions. Usable in static and dynamic applications.
This module is an extension and works only with the A or T modules.

LSD – Line Strain Distribution

While a full-field strain distribution via DIC Area analysis needs post-processing due to a high number of computational points, the Line Strain Distribution provides a colourful strain visualization feature during real-time measurement.

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.

DIN – Device Input

Enables real-time import of external values concerning force, motion, or temperature as an analog or digital signal into Alpha. Useful mainly for post-processing or measurements taking place outdoors.

3D – Stereoscopic DIC

Alpha 3D DIC combining DIC with stereo vision, can measure the 3D displacement field and surface strain field of 3D objects.

DIC SYSTEMS ITEMS

X-SIGHT 2D

- 1 × camera
- Calibration grids & speckle kit
- Standard lense of chosen focal length
- Battery LED lighting
- Transport box
- Cables and power sources
- Converter – 4-channel A/D, 2-channel D/A
- USB license dongle with installation SW
- Installation assistance and training
- 24 hrs of engineering support over 12 months

X-SIGHT 3D

- 2 × camera
- Calibration grids & speckle kit
- Stereobar camera mount
- Standard lenses of chosen focal length
- Battery LED lighting
- Transport box
- Cables and power sources
- Converter – 4-channel A/D, 2-channel D/A
- USB license dongle with installation SW
- Installation assistance and training
- 24 hrs of engineering support over 12 months

2D ▶ **3D**

DIC UPGRADE

- Additional camera
- 3D DIC software module
- Stereobar camera mount
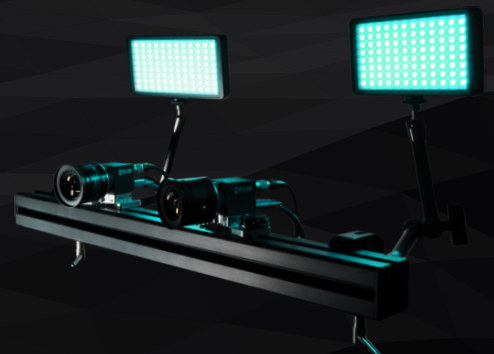
Optional Accessories

- Fast synchronization box
- LED lighting with USB relay
- Anti-glare kit (polarizing filter)
- Sync box for periodic events data acqusion

- Special semi-telecentric lens for small objects (10-500 mm) reducing out-of-plane motion
- Telecentric lens reducing out-of-plane motion for measuring small specimens
- Stereomicroscope

STITCHING MODES

Single Mode

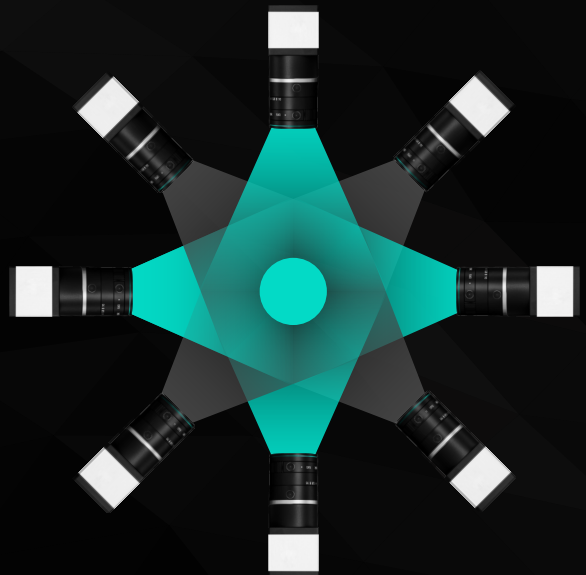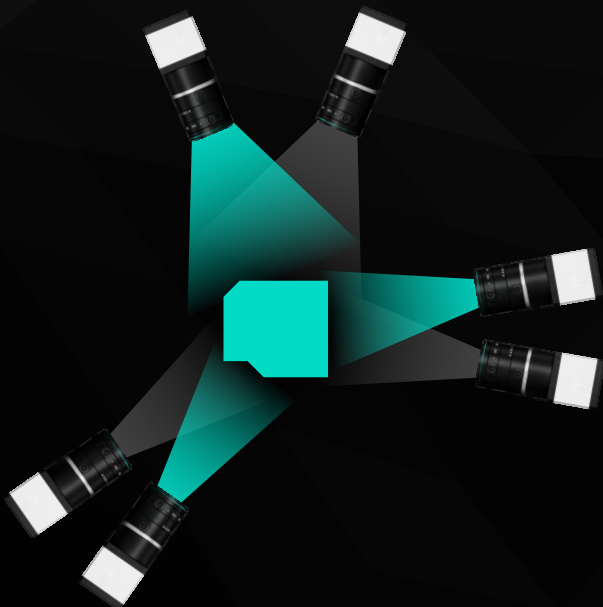The most common setup. Multiple camera pairs can be used simultaneously.

Dual FoV Mode

Setup with different resolutions where a point can travel between cameras.

Joined Mode

Identical FoVs where a point can travel between cameras.

XSIGHT

watch our videos at

www.xsight.eu

or contact us at

info@xsight.eu