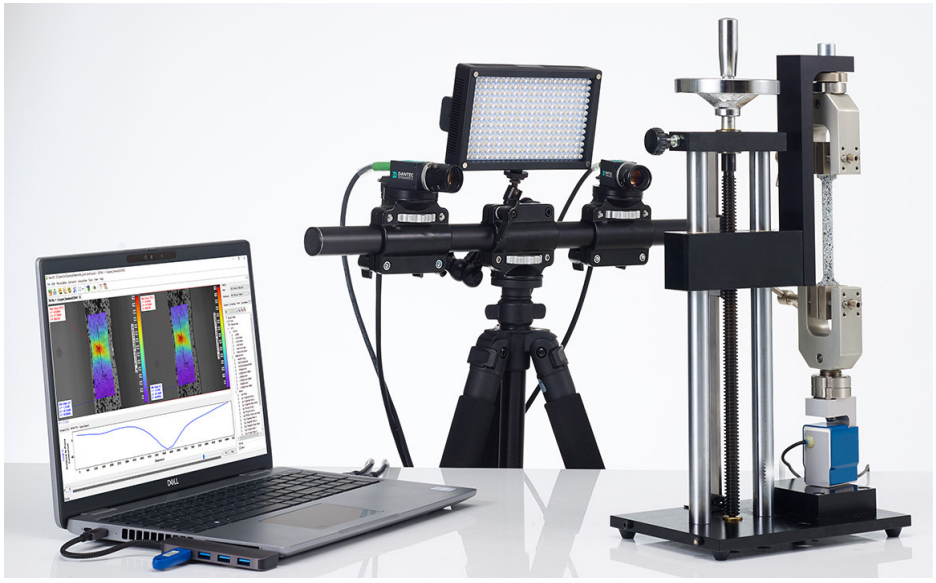
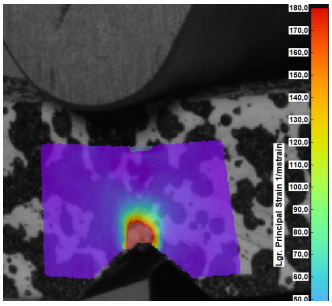
SOLUTION SHEET

EduDIC System

Digital Image Correlation (DIC) system for entry-level, academic training in experimental solid mechanics and materials testing





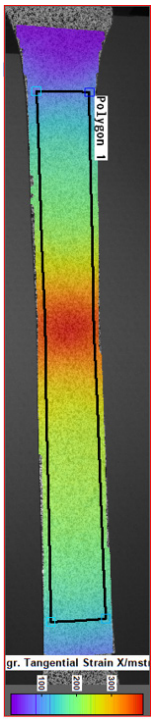
Istra4D 2D-overlay visualization of Lg. Principle Strain 1 (Major Strain) of a notched, plastic coupon in a quasi-static 3-point bending test.

One flexible measurement system for academia

The EduDIC is a Digital Image Correlation (DIC) measurement system designed as an entry-level, low-cost, academic training tool to assist tuition of experimental solid mechanics and materials testing.

This easy-to-use system gives academic instructors & students the ability to perform optical DIC measurements for research, workshop & laboratory exercises.

The EduDIC utilizes the full potential of Istra4D with no limitation in modular functionality, allowing unrestricted measurement data to be acquired quick & easy and correlated with high accuracy & precision.



Istra4D 2D-overlay visualization of the lagrangian tangential strain X in mstrain with one polygon gauge element (Polygon 1). X-direction was defined in the axis of loading. The polygon gauge element is used to calculate the Poisson Ratio.

Key benefits

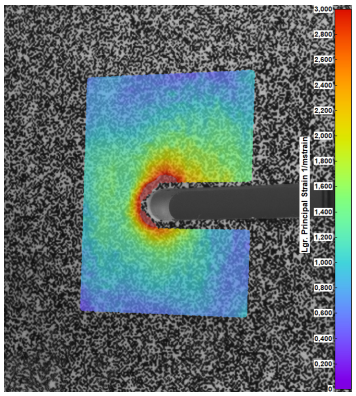
- Complete & fully equipped measurement system (including Laptop PC & Calibration Target)
- Incorporates 2.3 Mpx (@ 166 Hz) USB3 Vision CMOS camera/s
- Standard (std.) spatial resolution of 105 µm/px
- Flexible & adjustable stereo-rig
- No software functional limitations
- Upgradable system (i.e., with DAQ Controller)

Complete & fully equipped with minimum hardware

The EduDIC is a complete & fully equipped measurement system supplied with one Laptop PC and minimal hardware components, thus making setup quick and easy. The system operates in master/slave triggering mode, which is a special configuration that does not require connection to an external DAQ controller. Cameras only need to be connected to one another (for triggering) and to the Laptop PC (for data & power) – and that's all!

Measurement performance of the EduDIC system is harnessed using the technology of USB3 Vision. Up to two, 2.3 Mpx (1920 x 1200 px), CMOS cameras can be used which are capable of operating at a maximum frame rate of 166 Hz, at full resolution, with unrestricted recording capacity.

Setup of the EduDIC system

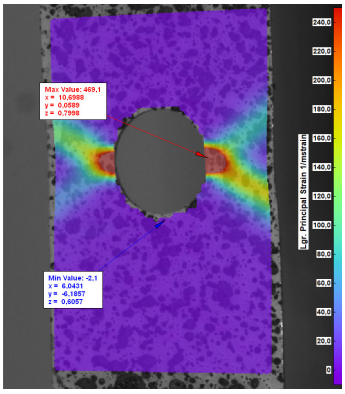


Istra4D 2D-overlay visualization of Lg. Principle Strain 1 (Major Strain) for stress concentration measurement of a CT-demo sample specimen.

Measure & test for a large scope of material testing applications

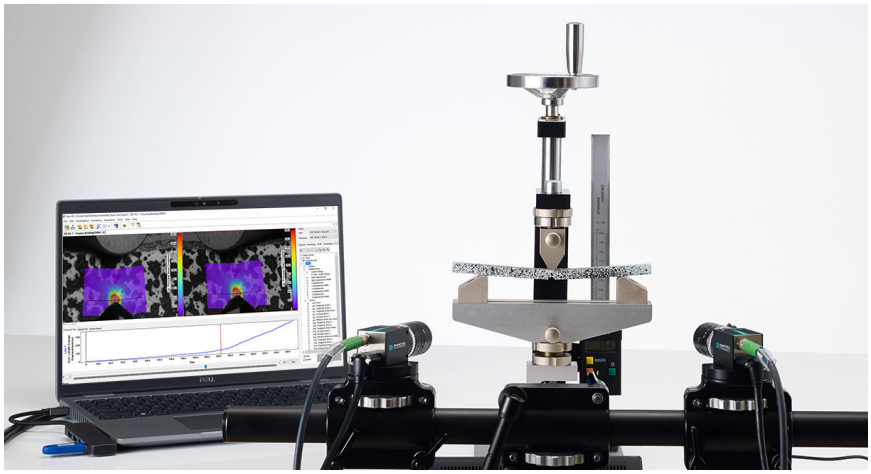
The EduDIC is a flexible & adjustable measurement system whereby the cameras may be aligned & moved freely on the mounting bar. As such, users can utilize different stereo-angles and/or baseline distance for better in-plane or out-of-plane, accuracy. Possible material testing applications include; simple, quasi-static tension, compression, buckling, bending, and fracture mechanic testing.

The EduDIC incorporates a standard 25 mm fixed focal length lens with standard Field-of-View (FoV) of up to a 200 mm (H) x 125 mm (V) at a Distance-to-Object (DtO) of 470 mm.



Istra4D 2D-overlay visualization of Lg. Principle Strain 1 (Major Strain) of an Alu. Coupon with a circular hole in a quasi-static tensile test.

Components of the EduDIC system

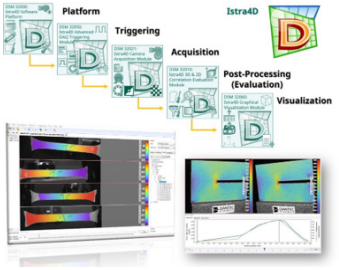


EduDIC system used to measure Lg. Principle Strain 1 (Major Strain) of a notched, plastic coupon in a quasi-static 3-point bending test.

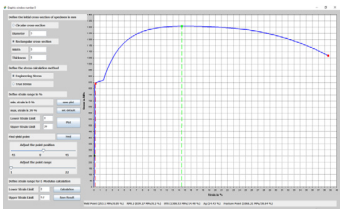
Istra4D Software Features

Modular Software with a Workflow Optimized for DIC

Istra4D is completely modular software giving users full flexibility in the module selection for a required measurement application. It allows users the possibility to expand & upgrade the capability of the Istra4D software if and when, the application scope of DIC testing expands.
The software is designed to be used specifically to do Digital Image Cor-relation (DIC). It is one software platform that is designed for an optimum user workflow experience for performing, complete DIC measurements from start to finish. Istra4D incorporates the entire measurement DIC workflow from hardware activation, imaging acquisition, correlation evaluation, post-processing visual-ization, and application scripting all in one software.



Istra4D software



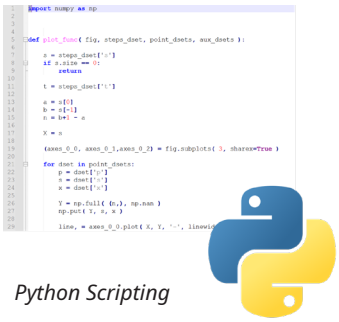
Istra4D software

Materials Testing Applications Package

1) Youngs Modulus ➙ Yield Point, 0.2% Offset, UTS, Fracture Point, Uniform (Prop.) Elong. (Ag)
2) Strain Tensor Comp. ➙ Engineering / Green-LaGrangian / True-Logarithmic / Almansi
3) Poisson Ratio ➙ Finite Grid Analysis
4) Strain Rate
5) Plastic Strain Ratio

Python Scripting

The programming language, Python, can be used in Istra4D for scripting & plotting. Users can code specific plots for their meas-urement testing application.



Python Scripting

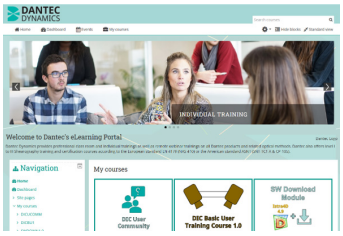
Customer Service & Support Benefits

Dedicated eLearning platform

Available to anyone, anytime and anywhere for both current and prospective customers alike – free of charge.

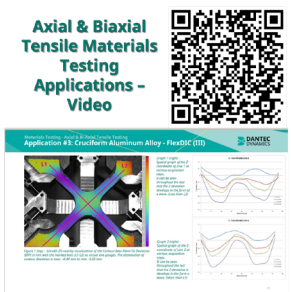
DIC Basic User Training Course

Incorporates a clear curriculum for basic users that includes recorded video demonstrations, tutorials, and coursework.



eLearning platform

Application Notes & Success Stories



Technical specifications

EduDIC	
Number of Cameras	1 or 2
Interface	USB3 Vision
Sensor	2.3 Mpx (1920 × 1200 px), CMOS
Frame Rate	166 Hz
Std. Lens Focal Length	25 mm
Camera Setup Configuration	Adjustable
Std. Field-of-View (FoV)	200 mm (H) x 125 mm (V)
Std. Distance-to-Object (DtO)	470 mm
Measurement Performance	
Std. Spatial Resolution	105 µm/px
Std. In-Plane Resolution	5 µm
Std. Out-of-Plane Resolution	10 µm – 50 µm
Strain Resolution	50 µstrain

Order information

	DSM 85200: 2D EduDIC System	DSM 85300: 3D EduDIC System
System	- 1x USB3 2.3 Mpx @ 166 Hz CMOS C-mount Camera - 1x C-Mount f=25mm Lens - 1x Laptop PC - 1x Istra4D Software Package incl. Software Platform, Camera Acquisition, Master-Slave Triggering, 2D Correlation Evaluation, and Graphical Visualization - Application Scripting Modules (free-of-charge) - FEA Validation Tool (free-of-charge) - 1x 80mm Calibration Target - 1x LED Illumination System - 1x Mounting Rail & Brackets (0.6 m) - 1x Lightweight Tripod	- 2x USB3 2.3 Mpx @ 166 Hz CMOS C-mount Cameras - 2x C-Mount f=25mm Lens - 1x Laptop PC - 1x Istra4D Software Package incl. Software Platform, Camera Acquisition, Master-Slave Triggering, 3D Correlation Evaluation, and Graphical Visualization - Application Scripting Modules (free-of-charge) - FEA Validation Tool (free-of-charge) - 1x 80mm Calibration Target - 1x LED Illumination System - 1x Mounting Rail & Brackets (0.6 m) - 1x Lightweight Tripod
Optional		
Lenses	f=8mm (DSM 19208) OR f=12mm (DSM 19512) OR f=16mm (DSM 19516) OR f=35mm (DSM 19535) OR f=50mm (DSM 19550)	
Hardware	DAQ & Triggering Controller (DSM 25022) & Istra4D Advanced DAQ Triggering Module DSM 32050)	
Speckle Patten Kit	Speckle Pattern Kit (DSM 50650)	
Illumination	XR-LED Illumination System (DSM 47100)	
Calibration Targets	110mm (KL 50111) OR 150mm (KL 50115) OR 200mm (KL 50120)	

DANTEC DYNAMICS Turn Measurements into Knowledge

Prager Elektronik

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