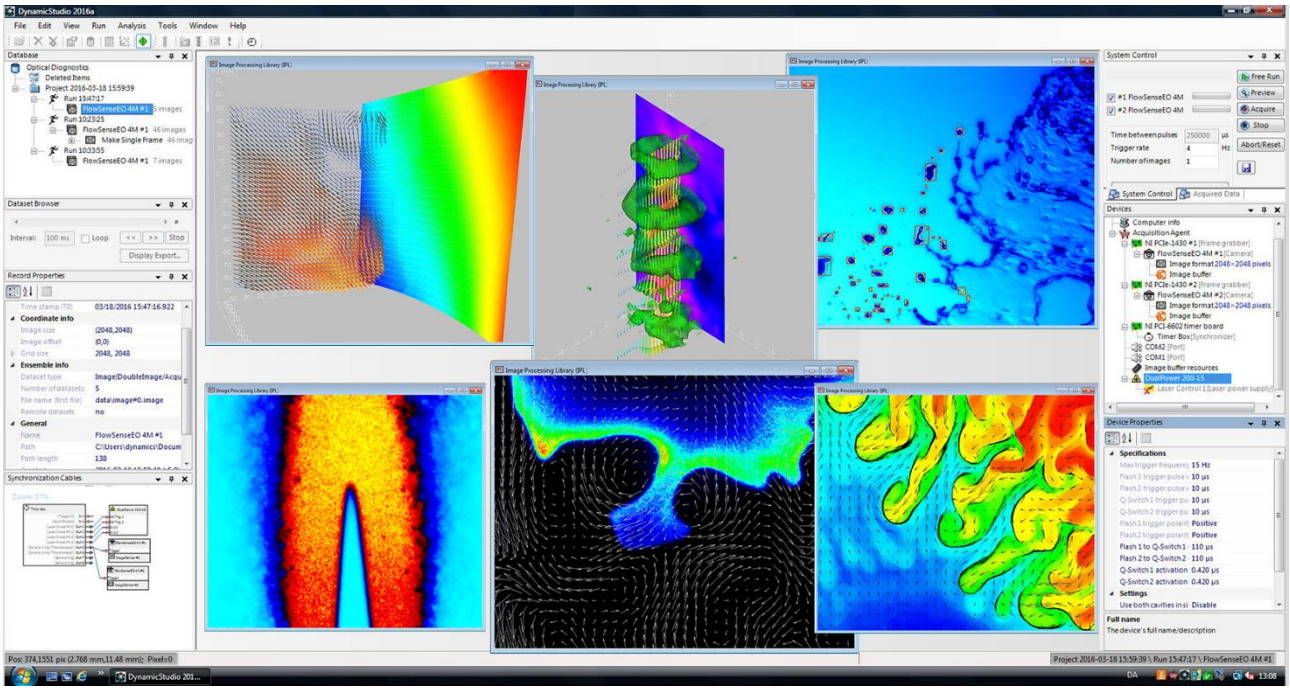
DynamicStudio – Base Package

The most user-friendly & comprehensive software for scientific imaging



▲ *Application examples:*

- Fluid/structure interaction (PIV/DIC)

- Water jet (Volumetric Velocimetry)

- Spray breakup (Shadow sizing & velocimetry)

- Flame temperature (Rayleigh thermometry)

- Flame turbulence & location (TR PIV/OH LIF)

- Magnetic micromixer (Micro PIV)

Makes advanced imaging measurements easy

DynamicStudio is the most user-friendly and complete software platform designed to support scientists doing imaging measurements. Wizards and assistance tools guide the user through experiments from data acquisition to final visualization of results – and the modular concept provides users with many add-ons so that system functionality can be tailored to current needs while also allowing expansion to meet future measurement requirements.

Key benefits

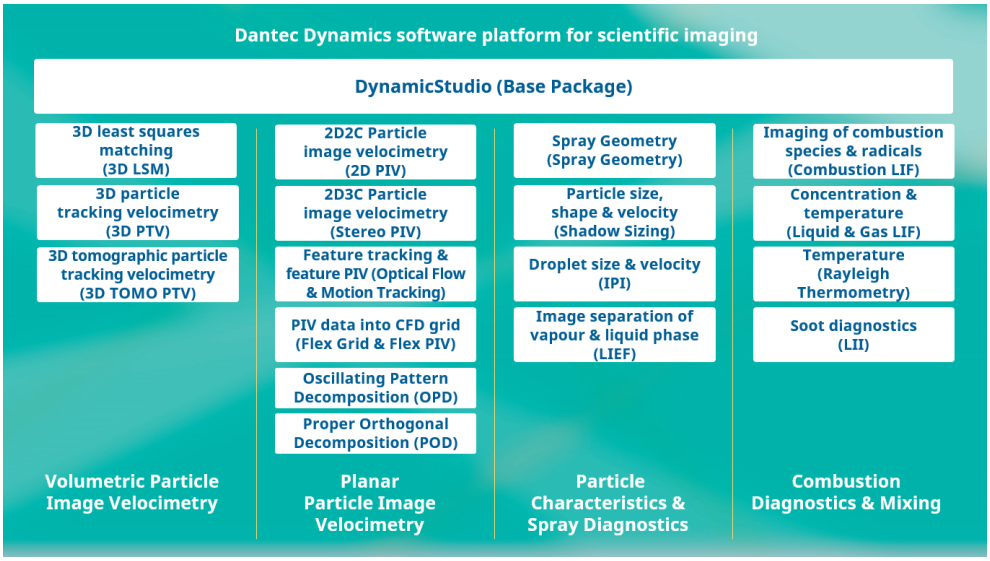
- Multi-parameter measurements within fluid dynamics, solid mechanics, microfluidics, spray/particle analysis, mixing and combustion diagnostics
- Image Processing Library for advanced pre-processing
- Uncertainty estimation based on particle disparity and correlation peak height ratio
- Acquisition Manager to provide automated calibration, measurement and data analysis
- Plug and play support of 100+ camera models and 25+ lasers
- Full use of 64 bit Windows 10 to handle large amounts of data and RAM
- Fast and efficient processing on multi-core computers using multithreading, distributed analysis and GPU
- Extensive range of post-processing methods and display options
- Full documentation of the experiment in a database; settings, parameters, notes etc.

The most complete platform for scientific imaging measurements

DynamicStudio accommodates a range of methods and techniques for imaging measurements within the field of fluid dynamics, spray diagnostics, particle characterization, mixing and combustion diagnostics, making it the most complete software platform for advanced scientific imaging-based measurements.

For imaging experiments DynamicStudio provides easy setup and control of hardware devices, data acquisition and storage, fast analysis and professional presentation of results in the form of graphs and images. The intuitive user interface features plug-and-play hardware devices and wizards for easy setup, automated measurement capabilities and smart data processing.

The software architecture is built upon a strong and powerful base package with many advanced and specialized add-ons.



DynamicStudio is a strong software platform that is the foundation for a wide variety of image based measurements

Due to its modular concept, DynamicStudio can be configured to meet current needs and easily upgraded to meet future requirements. For detailed information on the specific software modules, please consult separate data sheets for Volumetric Velocimetry, Planar PIV, Particle Characteristics & Spray Diagnostics and Combustion Diagnostics, respectively.

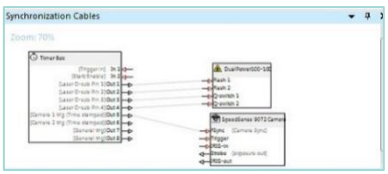
Easy setup, fast processing and professional visualization of results

With simple control of hardware components, DynamicStudio assists users throughout the entire experimental process from system setup to data acquisition and storage, and all the way to fast data analysis and presentation of results. The most important features and benefits at each step are highlighted below.

Preparation

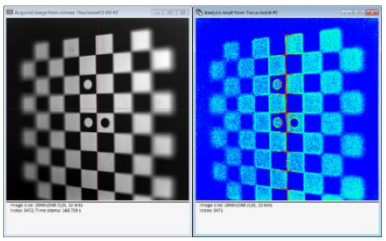
Experiment preparation is important but often very time-consuming. DynamicStudio offers multiple tools and wizards to help you through this process.

- Plug-and-play setup thanks to automatic detection of hardware and devices
- Hardware handling and synchronization
- Easy adjustment of parameters via Device Manager
- Synchronization cables window for guidance on cable connections
- Control of several measurement systems simultaneously e.g. combined PIV & LIF



Preparation: Auto detection of devices

- PIV Setup Assistant to help determine and adjust PIV system parameters such as Delta t, aperture settings and seeding choices
- Online particle concentration monitor for fast seeding adjustment
- Online focus assist for Scheimpflug adjustments
- Timing diagram to visualize triggering schemes

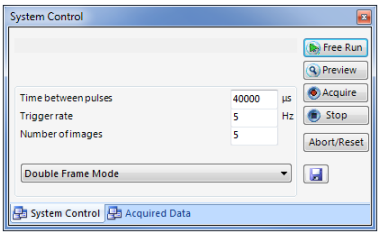


Preparation: Focus assist feature

Acquisition

Image acquisition is often an iterative process. DynamicStudio allows you to save time by minimizing the number of iterations.

- Three acquisition modes: Free run, Preview and Acquire
- Ability to select images and store in database in all three modes
- Free run mode – allows you to capture images without laser illumination
- Preview mode – for fine adjustment of device parameters before actual acquisition
- Acquisition mode – for final data recording and storage
- Acquisition Manager tool for automated routines for acquisition
- Synthetic particle image generator to check setting and learn to use the software

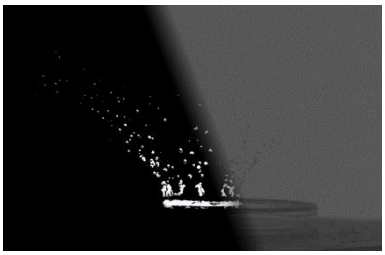


Acquisition modes: Free run, Preview, Acquire

Pre-processing

Acquired images are often not ready for immediate processing. Pre-processing tools allow you to perform a broad range of powerful functions to optimize image quality, calibrations, masks and dewarping.

- Image Processing Library (IPL) is a collection of image processing functions
- IPL helps you to get the best out of your measurements in challenging situations
- Image math is a useful macro language when the IPL reaches its limits or user-specific operations are desired
- Static masks can be generated manually or based on an algorithm
- Dynamic masking allows you to perform phase-separated measurements
- Image dewarping and distortion correction allows correction of optical distortions
- Camera Calibration supports multiple image models depending on the setup

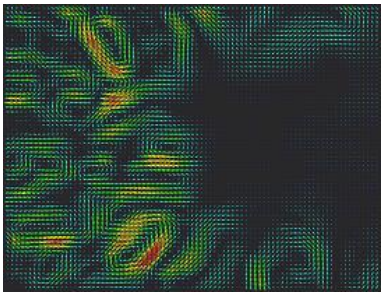


Pre-processing: Contrast enhanced and noise reduced image (left half) using the IPL compared to the original image (right half)

Processing

When it comes to processing DynamicStudio supports many powerful techniques for velocimetry, thermometry, concentration and particle measurement to do fast and accurate number crunching.

- Several techniques can be combined to provide multi-parameter measurements
- Each technique supports multiple algorithms addressing different applications (e.g. Adaptive PIV, LSM, PTV, or FlexPIV for velocimetry)
- Analysis sequences are user-defined routines that allow batch processing
- Fast processing support for multi-core processors and GPUs



Post-processing: Modal analysis (POD) to get further insight

Post-processing

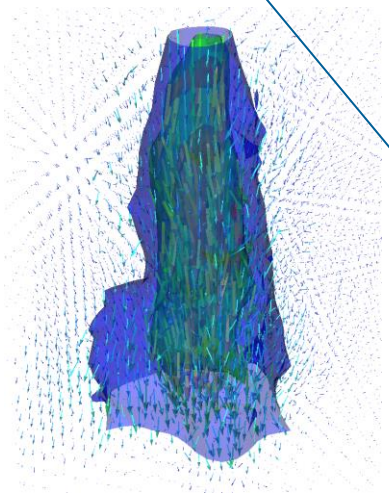
A full range of post-processing methods are integrated in DynamicStudio eliminating the need to consult other software programs.

- Statistics to get mean, RMS, Kurtosis, Skewness and many more
- Derivatives to get vorticity, λ_2 criterion, Q-criterion, gradients, shear stress etc.
- Modal analysis (POD, OPD) to get insight into underlying flow features & stability
- MATLAB/Octave link for customized post-processing without exporting
- Multiple uncertainty estimation tools for selected techniques

Visualization

DynamicStudio supports multiple graphics engines to create vivid, informative and highly advanced graphs, images and videos of your results.

- From 1D profile plots to 3D volume visualization
- Flexible, easy to use drag & drop overlay of all types of results
- Practical and adjustable 3D view for faster interpretation of three dimensional results



Visualization: 3D vector example

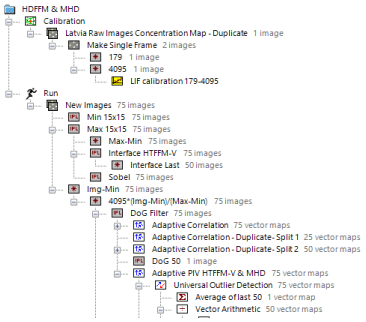
Export & Import

DynamicStudio also provides easy and fast exchange of data, images and processing information – either with other DynamicStudio users or other software programs.

- Export of numerical data
- Export/import of images
- Export/import of calibration results
- Export/import of analysis sequences
- Export of images and results as a video
- Export of image and result displays

Traceability & Continuity

To have full traceability and documentation of an experiment, DynamicStudio automatically saves analysis chains containing all hardware settings, pre-processing, processing, post-processing and visualization parameters. The analysis sequence is visualized as a tree structure with access to each element by simple mouse clicks. Also notes, pictures, spreadsheets, videos etc. can be stored within the DynamicStudio database to keep all information needed for a project in one location.



Traceability: Tree structure with easy access to each element

Enjoy the comprehensive and user-friendly experience

Thanks to the tools and feature set listed above, DynamicStudio provides a very efficient platform for scientific imaging. Time spent on measurements and data processing can be reduced so that users can focus on results for studies and research.

In addition, DynamicStudio controls and synchronizes a wide range of cameras, lasers and image intensifiers. Analysis sequences are built up dynamically, from the first simple results to advanced setups with preprocessing and automated acquisition to post-processing and refinement of the results. Combined with a flexible database structure, advanced analysis and the visualization modules, this make DynamicStudio the most comprehensive software platform capable of covering the widest range of applications.

DynamicStudio provides both on-line and off-line user manuals with help, tips and tricks, practical examples, tutorial videos and step by step guidance. Users can always quickly find the information they are looking for.

Technical specifications

PC requirements	Specifications
Minimum	PC with a modern multi-core Intel processor
	Microsoft® Windows© Windows 7™ x64 or Windows 10
	Microsoft® Windows© Installer v3.5 or later
	Microsoft® Internet Explorer© 6 or later
	Microsoft® .NET 4.5
	4 GB of RAM
	SXGA (1280x1024) or higher-resolution monitor with millions of colors
	Mouse or compatible pointing device

Order information

Category	Item	Item no
Software platform	DynamicStudio Base Package	80S57
Add-ons *Volumetric Particle Image Velocimetry*	3D LSM	80S21
	3D PTV	80S29
	3D TOMO PTV	80S20
Planar Particle Image Velocimetry	2D PIV	80S58
	Stereoscopic PIV	80S45
	Optical Flow & Motion Tracking	80S46
	Flex Grid & Flex PIV	80S43
	OPD	80S13
	POD	80S74
Particle Characteristics & Spray Diagnostics	Spray Geometry	80S87
	Shadow Sizing	80S48
	IPI	80S38
	LIEF	80S111
Combustion Diagnostics & Mixing	Combustion LIF	80S55
	Liquid & Gas LIF	80S85
	Rayleigh Thermometry	80S89
	LII	80S59
Miscellaneous	Distributed Analysis	80S84
	Traverse Option	80S76
	Tecplot Data Loader	80S79

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