INSIGHT™ V3V-4G ACQUISITION AND DATA ANALYSIS SOFTWARE VERSION 3

The INSIGHT™ V3V-4G Acquisition and Data Analysis Software Version 3 from TSI improves on the legacy established by our industry-known INSIGHT software package. Faster, more robust and with added capabilities, INISGHT V3V-4G is a complete 3-Dimensional 3-Component (3D3C) PIV software platform operating on Windows® 7 64-bit systems. The software is designed to manage TSI's V3V and V3V-Flex Volumetric PIV systems, based on the patented Tomographic Aperture-Encoded Particle Tracking Velocimetry (TAPTV) technique.

Features and Benefits

+ Online data collection, analysis and display during experiments
+ Get the highest number of particles in the measurement volume with TSI's patented particle reconstruction technique
+ Integrated MATLAB® toolbox for advanced image processing capability to present velocity field and other fluid quantities
+ Supports 3- to 4-camera system setups
+ Adaptable from low-speed, high pixel resolution cameras to high-speed cameras for (4D) TR-volumetric PIV
+ Supports low-speed to high-speed lasers
+ Supports calibration for the mapping of particles in a volume
+ Fast processing time to give vector field in minutes

The software provides data acquisition of multiple cameras and laser pulses through the electronics synchronization for the V3V and V3V-Flex Volumetric PIV systems. The software works with low/medium frame rate high resolution cameras, as well as high-speed cameras for time-resolved measurements. System calibration is important, as it provides the mapping related to the 2D particle images captured by the cameras and the actual locations of the particles in the measurement volume. The software offers easy control of the calibration process, allowing the system calibration to be completed quickly and precisely. The calibration is done by traversing a dotted target across the entire measurement volume.

Image analysis is produced with TSI's patented searching technique to map the particle locations in the 3D space. After the locations are discovered, particle tracking is employed to obtain the velocity field to obtain the velocity field, giving the highest possible velocity vector yield by matching each particle with a velocity vector. Interpolation can be used to obtain the grid velocity in a defined voxel space, providing the calculations of higher order fluid quantities, such as vorticity and turbulent shear stress.

The built-in MATLAB® program includes the presentation package, showing all the flow results in a 3D format. Rotation, translation and zooming features help researchers investigate the flow details and structures closely.

The grided velocity field can have high overlap to generate vector field or more than 1 million vectors.

SPECIFICATIONS

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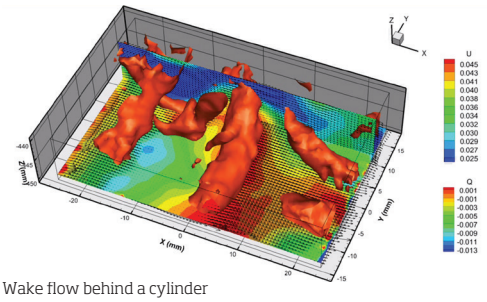
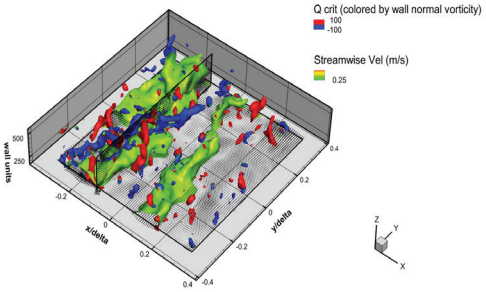
Image Capture Hardware Configurations

The Insight V3V-4G software is very powerful and versatile and can be used for all the volumetric PIV systems from TSI as illustrated in the following table.

System Type	Characteristics and Functions
	V3V-TS Volumetric PIV System + Optimal system with fixed volume size – 50 mm x 50 mm x 30 mm + Use of three camera configuration with detachable camera arrangement + High resolution cameras up to 29MPixels with frame rate up to 180 fps + High spatial resolution to resolve turbulent flow structure
	V3V-CS Volumetric PIV System + Optimal system with fixed volume size 140mm X 140 m X 100 mm max + Use of three camera configuration with detachable camera arrangement + High resolution cameras up to 29MPixels with frame rate up to 180 fps + Large volume size to capture complete coherent flow structure
	V3V-Flex Volumetric PIV System + Flexible camera arrangement for optimized measurement volume and spatial resolution + Support of high speed cameras for time-resolved volumetric measurements with capture rate up to 10kHz + Variety of hardware makes it possible to choose between high temporal or spatial resolution, or both + Upgradable from single camera PIV, stereo PIV and V3V to the latest configuration



Wake flow behind a cylinder



Turbulent boundary layer flow structure

Software Selections

Base software and Module	
InsightV3V-4G	Base software is required for all new systems
Module-VFlex-Cap	Module is required for the data acquisition of all V3V-Flex systems
Process V3V-4G	Process only software for data analysis and presentation
InsightV3V-4G-UP	The base software is used to upgrade from old versions of InsightV3V-4G to the current version

Specifications are subject to change without notice.

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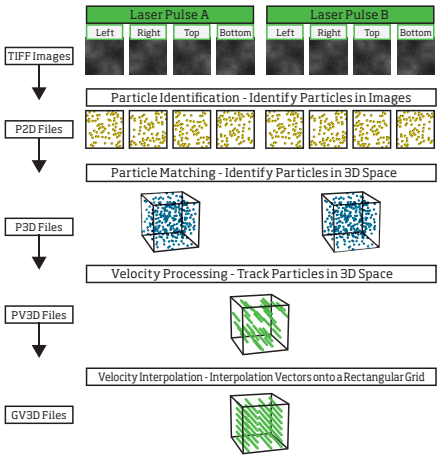
Image capture and analysis using the Insight V3V-4G software (for V3V-Flex PIV)



UNDERSTANDING, ACCELERATED

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