

The Invisible<sup>®</sup> Vision PiV series of multi-frame cameras are designed to achieve ultra fast shuttering combined with zero frame to frame distortion – so essential for quantitative particle image velocimetry applications in the analysis and scientific modelling of high speed events.

Camera options are being developed to enable the user the maximum choice in optimizing a 'bespoke' camera system for their application. Current system options include differing sensor arrangements from high speed video CMOS sensors through to ultra high resolution CCDs. Systems are also available with and without integral image intensification, the intensifier being chosen with a performance to match the sensor.



Spectral response can range from the UV to near IR (< 200nm to 1000nm).

Typical applications are in particle image velocimetry (PIV) for fluid dynamics but the cameras also find excellent application in combustion, electric discharge, nano-technology, biomedical and ballistics as well as many other high speed and ultra high speed macroscopic imaging requirements.

### PiV Model 40-16Mi-V

The PiV 40-16MIV camera system is the ultimate state-of-the-art camera system for ultra high speed shuttering with resolution. With two independent user programmed intensified frames, each with a minimum exposure of 20ns (10ns optional) and a 16 Mega-pixel CCD, the system can easily capture in great detail ultra high speed events over an extensive temporal (and illumination) range. In addition, each frame may be multiple exposed for even greater flexibility. An optical viewfinder is included as an option (-V) for aid in focus and system setup. The system is intrinsically both UV and visible sensitive but can be ordered either with an S20 (UV bias) or S25 (visible bias) photo-cathode.

Synchronization is easily handled with positive, negative, make and break (self powered) input trigger signals and four user programmable output strobes (plus gate monitor) for the additional synchronization of external cameras, systems or strobes or even to trigger the experiment itself.

All PiV cameras are designed to be easy to use and come complete with turn-key Windows based software. Extremely compact and rugged, with easy GigE interfacing and simple power supply and operational requirements the units are designed for a long installed life with the minimum of service requirements.

## Intensifier

Input Window	Quartz
Photocathode	S20 or S25
Spectral range	200 to 800nm (standard – others upon request).
Output Window	Glass.
Phosphor	P46 standard – others upon request.
Gain	Up to 2,000 (P46)
Output Diameter	40mm
Gating	20ns Minimum (standard unit).
Resolution	35+ lp/mm.

## CCD

Pixels	4872 (h) x 3248 (v) with 7.4µm pixels.
Dynamic Range	65dB - Digitized to 12 bit.

## Optics

Input	Nikon F – mount.
Internal	High resolution F/2.8 image relay

## System

Resolution	<b>Double Imaging, Multiple Exposure.</b> 16M pixels 4872 x 3248.
Exposures	CCD / II / Objective Lens > 1300 TV lines per picture height.
Delays	20ns to > 1ms in 10ns steps (10ns optional -10) From input trigger 100ns to > 10ms in 10ns steps. 10us minimum between 1 <sup>st</sup> – 2 <sup>nd</sup> frame.
Gain Control	User programmable 0 to 100% (12 bits).
Triggering	TTL Positive, TTL Negative. Make / Break (self powered).
Outputs	User Programmable TTL Gate monitor. Four User Programmable TTL 'strokes'
Protection	Built in mechanical capping shutter.
Software	Bespoke application software including full camera control and image storage/analysis/export options.
Viewfinder	Optical viewfinder for ease of use.
Interface	Gigaset Ethernet (GigE) direct to PC.

## Environmental

Dimensions (approximate)	105 x 85 x 366mm (excluding objective lens).
Weight	3.75 Kg.
Power	30W max (90-264VAC).
Temperature	0°C to 40°C, non-condensing humidity.
Construction	Aluminium housing.
Mounting	2 x 3/8-16 UNC thread on base.
Documentation and Software	Supplied on CD.
Packaging	Heavy duty IP65 flight box.

## **CE and RoHS (Pb free)**

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