

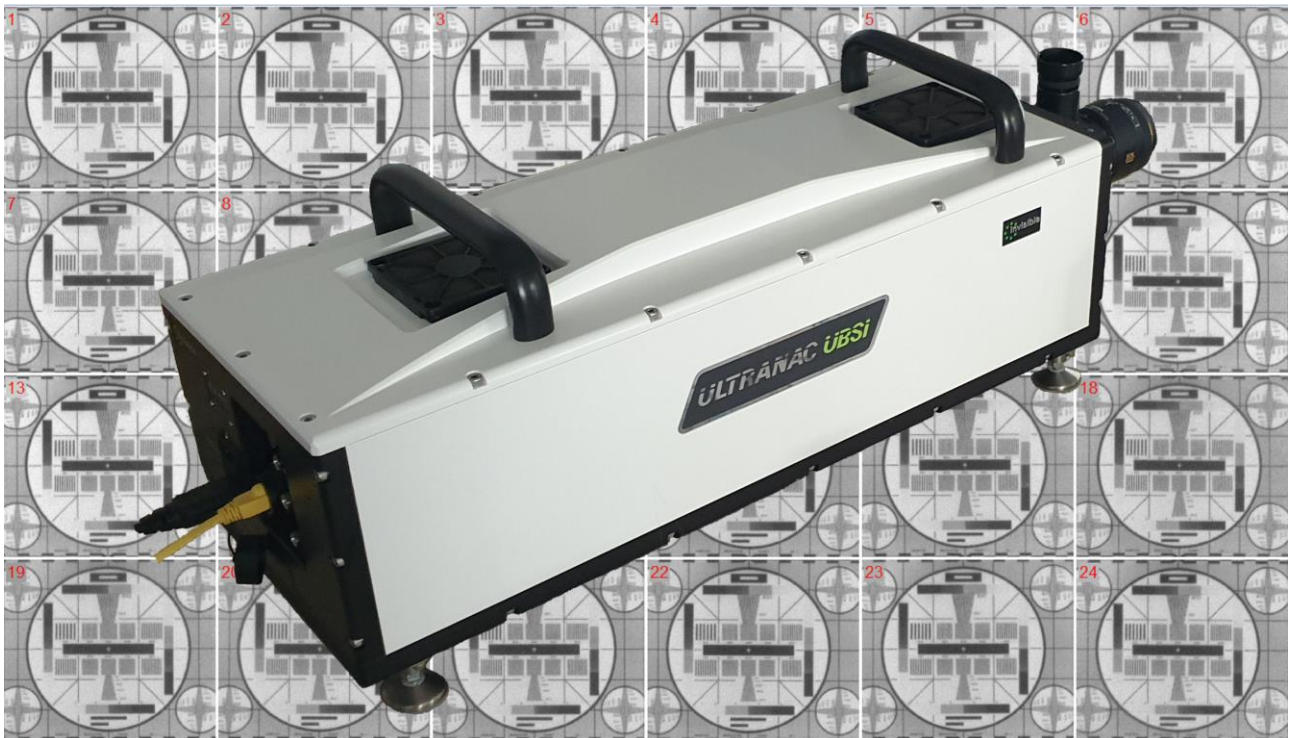


*Making the invisible visible*

# ULTRANAC UBSi

## True 1 Billion FPS Ultra High Speed Framing Camera

The Invisible® Vision Ultramac UBSi™ series of compact ultra-high-speed framing cameras are designed to capture up to 24 mega-pixel performance frames at speeds up to and beyond a true 1 Billion frames per second (optically calibrated exposures to 1ns). The cameras are derivatives of the UHSi camera system but with enhanced timing capabilities and optimized shuttering for the accurate imaging of the very fastest events. Currently available in two models usually as a fully optimized straight 12 frame camera for maximum sensitivity or as a 12 & 24 frame system (uses a faster but less efficient phosphor but with a ten microsecond gap between frames 12 and 13 for phosphor decay). Each model has fully independent user programmable exposure and inter-frame time delays down to 1ns allowing true frame rates to 1 billion fps (internal exposure timing calibrated on 20ps boundaries). Fully intensified with simple input electrical triggering, output shutter monitor and programmable electrical strobe timing outputs gives the user maximum flexibility.



At the heart of the Ultramac UBSi is a unique high-resolution beam-splitter with optional UV capability. This is complimented with an *Ultra* 'segmented' intensifier and 16M pixel GigE linked CCD. Together with flexible proven control and timing electronics plus powerful system software they combine to form an elegant, reliable, yet cost effective 1 billion frame per second ultra-high speed imaging system.

Typical applications are in plasma physics, electric discharge, detonics, impact, shock physics and high energy material studies.

The Ultramac UBSi is easily controlled with the included IVV Imprint® PC software running on a laptop via a GigE connection. For ease of use, an optical viewfinder is also available to aid set-up and alignment. Simplicity being a virtue, the camera provides a simple single 50Ω input trigger as well as a manual software trigger mode. Four programmable output strobes plus a shutter monitor signal are provided for external synchronization of further cameras, experiment triggering and flash systems.

### The Ultramac UBSi 12/24

- 1 Billion FPS
- Up to 24 Frames
- Megapixel Performance
- UV Versions Available

## Intensifier

Input Window  
Photocathode

Custom Design, Patented.  
Glass (UV option available on Sapphire).  
S25, 400nm to > 850nm (S20 UV option).  
S25 typically > 300µA/lumen (white light).  
Typically set to maximum of 5000.

Gain

## Optics

Input  
Beam-splitter  
View-finder

Custom Design, Patented.  
Standard Nikon F-mount.  
Bespoke, 12+ way, visible with UV option. f/2.  
Automatic optical viewfinder / capping shutter.

## CCD

Pixels  
Dynamic Range

4872 (h) x 3248 (v) with 7.4µm pixels  
65dB – Digitized to 12 bit

## System

Frames

UBSi-12: 12 frames @ 1Bn fps optimized.  
UBSi-12/24: 12 frames @ 1Bn fps + further 12 @ 1Bn fps 10µs later  
12 (24 on UBSi 12/24) Frames @ 1000 x 860 pixels per image.  
Fast Timing Jitter for frames from system trigger typically 130ps.

Resolution  
Timing / Trigger Jitter

200MHz (5ns period) system clock.

Framing Rate  
Exposures (Optically Calibrated)  
Delays

1Bn fps (1,000,000,000 fps)  
1ns to > 1ms in 1ns steps.  
From Input Trigger: 180ns to > 10ms in 1ns steps. Optically  
calibrated (minimum calibrated delay is set to < 200ns by s/w).  
Interframe times: 0 to > 1ms in 1ns steps.  
Note: For delays > than 1µs system reverts 200MHz system clock  
For UBSi 12/24 Only: 10µs nominal between frames 12 and 13 only  
User programmable 0 to 100% (10 bits).

Gain Control  
Triggering  
Outputs

50Ω BNC TTL/5V Positive.  
1 x Shutter Monitor Output (50Ω BNC)  
1 x User Programmable TTL Gate monitor. 5ns timing steps  
4 x User Programmable TTL 'strokes'. 5ns timing steps  
Gigabit Ethernet (1000Mb/sec - GigE) direct to Windows PC.

Interface

## Environmental

Dimensions (excluding objective lens)

Approx 230mm (wide) x 200mm (height) x 720mm (long)  
(Excludes protruding handles & feet)

Weight (excluding objective lens)

25Kg approx. (55 lb - avoirdupois pounds)

Power

120W max (90-264VAC).

Temperature

0°C to 40°C, non-condensing humidity.

Construction

Solid aluminium housing with large carrying handle.

Mounting

2 x 3/8-16 UNC on base (Options available upon request).

Documentation and Software

Supplied on CD.

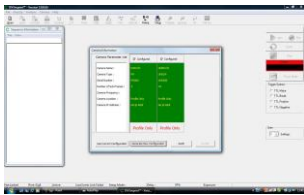
Packaging

Heavy duty IP65 flight box.

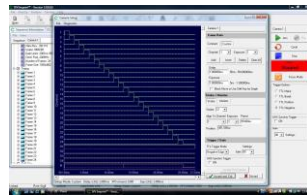
CE and RoHS (Pb free)

## Software

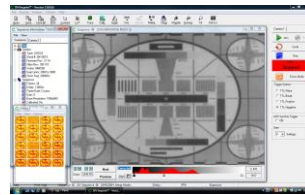
IVV Imprint® PC software as standard. Software seamlessly allows for full multi-camera control, capture, image analysis and file export for all current IVV camera types. Windows® 7,8,10,11.



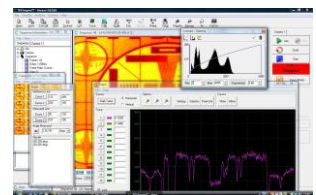
CONFIGURE



TIMING



CAPTURE



ANALYSE

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