

Provisional Data
ICNSGC Ultra Fast Nano-second Gated ICCD Camera System



Introduction

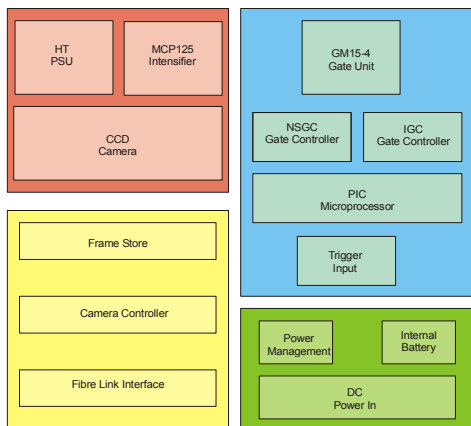
Unlike many high speed cameras the ICNSGC is a nanosecond gated camera with inherently low jitter. The camera features built-in delay and exposure adjustment in 250ps increments where delay and exposure times are below a microsecond. and communicates with a PC computer via fibre optic links. Multiple cameras can be daisy chained together providing high speed imaging capabilities in excess of 500 million frames per second. Each camera requires it's own lens and this improves the sensitivity compared to the conventional beam splitter approach. Having different cameras also allows different view of an object to be obtained. The square housing design enables a close packed array of cameras with lens centres on a 112mm separation.

Single Shot Applications

The ICNSGC Camera has been specifically designed for single shot applications. Once armed, the camera will wait indefinitely for a trigger pulse and then capture a single image. Two trigger pulses are require, one to arm the CCD camera, the other to trigger the cathode gating circuitry.

Fibre optic interface

The camera utilises a fibre optic interface thus allowing the camera to be positioned over 200 metres from the controlling PC computer. The use of the fibre optic interface dramatically reduces interference problems from electrically noisy environments.



ICNSGC Block Diagram

Multiple camera Support

The system supports a novel "Ring" technology, where multiple cameras may be cascaded together. When operating in a multi-camera mode, the output from one camera feeds into the input of the next camera. Each camera is defined by a unique 8 bit code thus allowing a maximum of 253 cameras to be connected to a single PC interface. Both commands and data are multiplexed through the fibre cable thus reducing cabling requirements.

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Document	ICNSGC01
Issue	Prov. 1
Date	07 January 04

Internal note: Date can define version of unissued specification

Built in frame store

Each camera has a built in frame store capable of holding the image from a single exposure. After the acquisition of the event, the pc addresses each camera and downloads the image data.

Ultra fast gating electronics

The ICNSGC camera incorporates two separate gating controllers. A high precision delay and pulse generator is used when both the exposure and delay are below 1us. In this case delay and exposure times are programmable in 250ps steps with a minimum exposure time of 1-2ns. Jitter between the trigger and start of exposure is around 1ns. If either the delay or exposure is greater than 1us then registered delay and exposure counter is used. Both delay and widths are programmed in 10ns increments with jitter between the trigger and exposure of 10ns. In both cases there is an inherent delay between the trigger and start of exposure of 180ns.

Battery Operation

In some cases, particularly in noisy electrical environments, it is desirable to operate the camera from its own internal battery supply, which is capable of lasting for around 30 minutes. When operating in battery mode, the camera is electrically isolated from the external mains supply with all communications and triggering being carried out through fibre optic cables.

RTC-8 Remote Trigger Controller



The RTC-8 remote trigger controller accepts the camera pre-trigger pulse and the intensifier trigger

pulse and encode both triggers into a signal which is transmitted down a single fibre optic to each camera. Each trigger controller is capable of fibre optics for eight cameras.

RBC-4 Remote Battery Charger



The RBC4 battery charger has the necessary circuitry for rapidly charging up to 4 cameras. This is an optional unit and is only required if remote battery operation is required.

Software

A special version of Photek's IFS32 software is provided. This provides control of the camera along with data acquisition. See the IFS32 data sheet for further details.

Specification

Image intensifier	MCP125
Input window	Fused silica
Photocathode	> 20mA/W @254nm > 25mA/W @ 350nm > 40mA/W @ 450nm > 30mA/W @ 550nm > 20mA/W @ 650nm
Uniformity	10-15% SD/Mean
Resolution	16-20 lp/mm
Gain	10,000 Watts/Watt @
500nm	
Image Format	768 x 576 pixels
Active area	20mm x 15mm
Gating speed	<2ns
Jitter	<1.5ns
Inherent delay	180ns
Lens Mount	C, F or flange
Battery life	30-45 minutes
Mechanical	112mm x 112m x 250mm
Power	+18V DC (External universal power brick provided)

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