



ICCD Detectors

Imaging Charge Couple Device:

Time domain measurements have become increasingly important in many materials and spectroscopic analysis. Time gated measurements, which capture small time intervals but with full spectral information, are one key technique.

HORIBA Jobin Yvon has been very active in time resolved measurements and our Intensified Charge Couple Device (ICCD) system is an ideal choice for time gated spectral applications from nanoseconds to seconds in the UV/Vis regions.

Technical Specifications:

The HORIBA Jobin Yvon i-Spectrum Two ICCD detectors provide a fully integrated instrument for time resolved measurements. Our detectors offer superior performance in gating frequency, speed, sensitivity, dynamic range, readout noise and spectral acquisition rates – all in a compact, rugged and economical package.

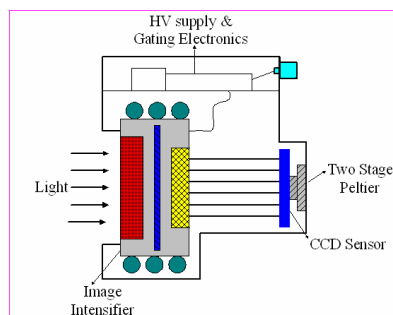
The i-Spectrum Two family of Intensified CCD detectors is designed with scientific grade thermoelectrically cooled CCDs and a grade (1) gateable image intensifier. As its name suggests, the image intensifier amplifies, by a factor up to 10^4 , the intensity of the incident light upon it which is then detected by a CCD sensor. The image intensifier can be switched on and off in a few nanoseconds, allowing it to act as an ultra fast electronic shutter. This controls the exact timing of the signal incident onto the CCD sensor, making these detectors ideal for nanosecond scale time resolved measurements of transient phenomena.

The ultra electronic gating capabilities of the i-Spectrum Two ICCDs also makes them perfect for measurements requiring the isolation of weak signals of interest from a strong noise background. In applications such as pulsed Raman spectroscopy and plasma analysis by laser-induced fluorescence, the detector can be precisely synchronized to collect signal for a few nanoseconds when laser is on. This allows the detector to gate out any noise background or fluorescence when the laser is off.



ICCD detectors

Schematic of i-Spectrum Two detector



Horiba Jobin Yvon offers ICCDs with typical time resolution from 5 ns (gate width) while processing the highest quantum efficiency of the photocathode.

Benefits

- High performance ICCD
- High sensitivity
- Ultra High speed
- Integrated DDG
- Full trigger capability
- Compatible with most spectrographs
- Compact, rugged
- Extremely low dark current
- Fully automated with LabSpec for windows



ICCD Detectors

An ICCD detector for time resolved measurements at a high speed rate

Technical Specifications :

Our i-Spectrum Two ICCD detectors are the second HORIBA Jobin Yvon ICCD generation. Our new design includes Intensifier driven by an internal or external Pulse and Delay Generator (option). Controlled by a crystal with 100MHz repetition rate, the Pulse widths of the Spectrum Two ICCD detector can be selected from 5 ns to 640 sec with 1ns delay. Electrical triggers "IN", with an internal jitter of less than 30 ps, allows for a perfect control of the acquisition.

CCD chip specifications

Chip Type	1024x256
Active pixels	690x256
Architecture	Front illuminated Full Frame
Chip Format	18 mm x 6.7 mm
Pixel size	26x26 μm
Individual Pixel Full Well Capacity (Ke-)	500 (Typ) 300 (Min)
Readout Register Full Well Capacity (Ke-)	750 (Typ)
Read out noise (e- rms)	4 (Typ) 6 (Max)
Dynamic Range	125,000:1
Dark Charge	0.3 e/pix/sec
Working Temperature	-35°C

Intensifier Specifications

Intensifier Type	18UVF
Input Window	UV grade quartz
Intensifier type	Gen II
Photocathode	S20
Output Window	Fiber optic
Coupling between intensifier and CCD	By taper
Phosphor Screen	P43 phosphor standard. Other phosphors are also available
Photocathode diameter	18 mm
Maximum Photocathode repetition rate	50 KHz
Spectral range (nm)	180 - 850
Minimum Gate Width	5 nsec

The Intensifier photocathodes

In all i-Spectrum Two ICCDs, the spectral response is determined by the quantum efficiency (QE) of the intensifier photocathode as a function of the wavelength. The figure 1 shows the typical quantum efficiencies of our standard photocathode presently available with the i-Spectrum Two ICCDs. For measurements in the UV and near infrared spectral regions, HORIBA Jobin Yvon offers SuperGen intensifiers with S20 photocathodes. Other photocathodes optimized for other spectral range or with better quantum efficiency can be offered. Contact Horiba Jobin Yvon for more details.

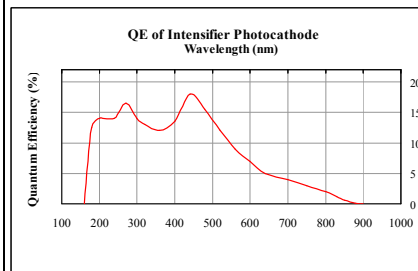


Figure 1

Typical Quantum efficiencies of Intensifier Photocathodes

— S20 Gen II Quantum Efficiency

* Specifications subject to change without notice.

HORIBA JOBIN YVON

(All HORIBA Jobin Yvon companies were formerly known as Jobin Yvon)

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