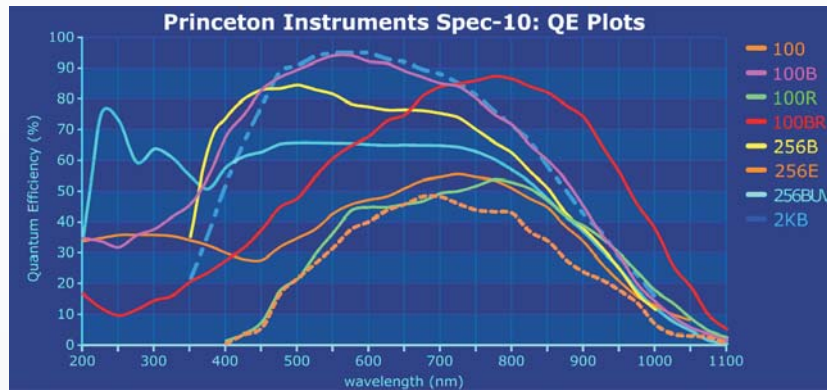


# S&I

Spectroscopy & Imaging GmbH

## Raman Spectrometer Detectors

### CCD Camera Solutions



- Peltier cooling, down to  $-100^{\circ}\text{C}$  without liquid assistance
- Liquid nitrogen cooling, down to  $-120^{\circ}\text{C}$  with LN hold time  $> 30$  hours
- $\pm 0,04^{\circ}\text{C}$  thermostating precision
- Highest performance Princeton Instruments exclusive CCDs
- 16 Bit dynamic range
- Dual capacity mode, maximize dynamic range or signal to noise
- Dual ADC speed and gain selection
- Multiple trigger modes, external shutter control and TTL IO's
- USB and high speed PCI interface

### Specifications

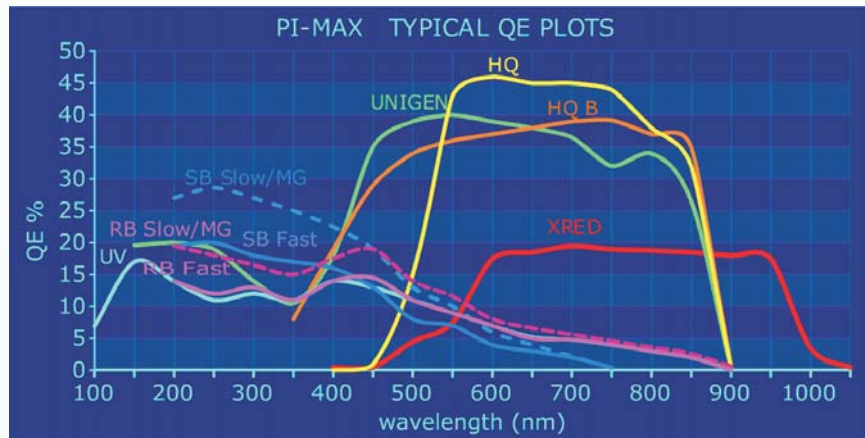
Model	Wavelength Range see: QE Plot	Peak QE (%)	System Read Noise (e- rms at 100 kHz)	Dark Noise (e-/s/pixel)	Imaging Array (pixel)	Pixel Width ( $\mu\text{m}$ )
Spec10:100	— 100	47	$<4$	$< 0,0003^*$	340 x 100	20
Spec10:400	— 100	47	$<4$	$< 0,0003^*$	340 x 400	20
Spec10:100R	— 100R	53	$<4$	$< 0,01^{**}$	1340 x 100	20
Spec10:400R	— 100R	53	$<4$	$< 0,01^{**}$	1340 x 400	20
Spec10:100B	— 100B	93	$<5$	$< 0,0003^*$	1340 x 100	20
Spec10:400B	— 100B	93	$<5$	$< 0,0003^*$	1340 x 400	20
Spec10:100BR	— 100BR	85	$<5$	$< 0,01^{**}$	1340 x 100	20
Spec10:400BR	— 100BR	85	$<5$	$< 0,01^{**}$	1340 x 400	20
Spec10:256	— 100	47	$<8$	$< 0,003^{***}$	1024 x 256	26
Spec10:256E	— 256E	53	$<8$	$< 0,003^{***}$	1024 x 256	26
Spec10:2K	— 100	47	$<4$	$< 0,0015^{***}$	2048 x 512	13,5
Spec10:2KB	— 2kB	85	$<3$	$< 0,0015^{***}$	2048 x 512	13,5
Spec10:2KBUV	— 2kBUV	72	$<3$	$< 0,0015^{***}$	2048 x 512	13,5

\* at  $-120^{\circ}\text{C}$ , \*\* at  $-100^{\circ}\text{C}$ , \*\*\* at  $-75^{\circ}\text{C}$

April 2004, subject to change without notice

## Intensified CCD Camera Solutions

### Princeton Instruments **PI-MAX**



- XRED: Gen III optimized NIR photocathode, spectral response up to 1050 nm.
- HQ: Gen III intensifier, high QE (46%) plus high resolution (64 lp/mm)
- HQ Blue: Gen III intensifier, 72 lp/mm resolution, 40% QE, previously only available with back-illuminated CCDs.
- UNIGEN™ : HQ Blue Gen III intensifies with supplementary UV response to 185 nm.
- RB: fast gate width 2 nsec, low-EBI tube for CW experiments, red/blue-balanced.
- RB Slow: tube with slow gate option. Unusually high QE by eliminating the conductive underlay used for fast gating.
- SB: fast gate width 2 nsec, the super-blue photocathode response from the UV out to 500 nm.
- SB Slow: tube with slow gate option. Unusually high QE by eliminating the conductive underlay used for fast gating intensifiers.
- UV: for deep UV with MgF<sub>2</sub> window for optimum sensitivity down to 120 nm.
- Phosphor decay time down to 1%: P20 60 msec, P47 0.4µsec, P46 2 µsec, P43 3 msec

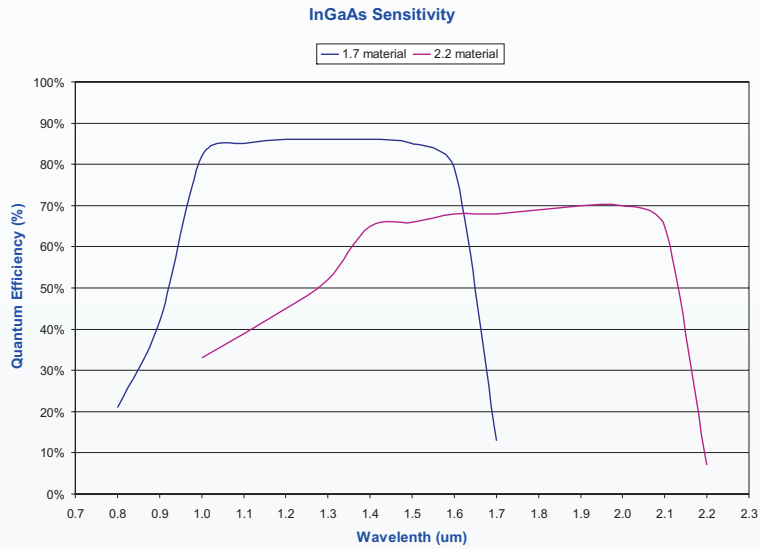
### Specifications

Model	Intensifier (mm diameter)	Wavelength Range <small>see: QE Plot</small>	Peak QE (%)	min. Gate Time (ns)	Resolution (lp/mm)	Imaging Array (pixel)
PI-MAX2:1003 (Gen II)**	18	RB / SB / UV	15 to 20	<2	45 or 54	1024 x 1024
PI-MAX2:1003 (Gen III)**	18	HQ / HQBlue / XRED / UNIGEN	45	<5	64 or 72	1024 x 1024
PI-MAX2: 512 (Gen II)**	18	RB / SB / UV	15 to 20	<2	45 or 54	512 x 512
PI-MAX2: 512 (Gen III)**	18	HQ / HQBlue / XRED / UNIGEN	45	<5	64 or 72	512 x 512
PI-MAX: 512 (Gen II)	18	RB / SB / UV	15 to 20	<2	45 or 54	512 x 512
PI-MAX: 512 (Gen III)	18	HQ / HQBlue / XRED / UNIGEN	25 to 30	<5	64 or 72	512 x 512
PI-MAX: 1K (Gen II)	18	RB / SB / UV	15 to 20	<2	45 or 54	1024 x 1024
PI-MAX: 1K (Gen III)	18	HQ / HQBlue / XRED / UNIGEN	45	<5	64 or 72	1024 x 1024
PI-MAX: 1024 (Gen II)	18/25	RB / SB / UV	15 to 20	<2	45 or 54	1024 x 256
PI-MAX: 1024 (Gen III)	18/25	HQ / HQBlue / XRED / UNIGEN	45	<5	64 or 72	1024 x 256

\*\* PI-MAX2 5 MHz Readout

April 2004, subject to change without notice

## NIR InGaAs Camera Solutions



- 1024 x 1 and 512 x 1 arrays
- Thermoelectric or LN cooling with temperature tuning feature
- 16-Bit / 1-MHz digitization, PCI or USB 2.0 interface
- Software-selectable dual-amplifiers
- Build-in electronic shutter
- Up to 1800-Hz spectral rate
- Fully integrated with the new TR555 Triple NIR Raman Spectrograph

### Specifications

Model	PDA architecture	format	pixel pitch (um)	read noise	peak QE
512-1.7 (LN)	linear	512 x 1	50 x 500	650 e-	> 80% @ 1.0 to 1.55 um
512-1.7 (TE)	linear	512 x 1	50 x 500	650 e-	> 80% @ 1.0 to 1.55 um
1024-1.7 (LN)	linear	1024 x 1	25 x 500	650 e-	> 80% @ 1.0 to 1.55 um
1024-1.7 (TE)	linear	1024 x 1	25 x 500	650 e-	> 80% @ 1.0 to 1.55 um
1024-2.2 (LN)	linear	1024 x 1	25 x 250	520 e-	> 70% @ 1.4 to 2.0 um