

# SmartEngine™ Series

Display Panel or Semiconductor Inspection  
Raman System/ Biomedical Detection  
Environmental Monitoring Analysis



## SmartEngine Series Lineup

Model	Detector Type	Characteristic
SE-3	CMOS with Fast Exposure	Shortest Exposure Time (0.2 ms)
SE-4	Front-illuminated CCD	Excellent Cost Performance Value
SE-5	CCD with NIR-enhancement	NIR Range with High SNR
SE-7	High Pixel-Resolution CCD	High Pixel-Resolution
SE-8	CMOS with Fast Exposure	Short Exposure Time (0.4 ms) & High Pixel-Resolution
SE-9	CCD with Fast Exposure	Full Wavelength Range with Fast Exposure Time (1.5 ms)
SE-10	CCD with High Sensitivity	Excellent Sensitivity
SE-12	CMOS with Fast Exposure	High Sensitivity & Shortest Exposure Time

- Excellent thermal, humidity, vibration and shock stability.
- Continuous high-speed & multiple exposure modes.
- Proprietary stray light calibration algorithm (0.01%).
- On-board CPU supports optical and color parameters calculation.
- Highly customisable, wide choice of sensor and grating.
- Grating selection includes:
  - Extremely low (near-zero) coefficient of thermal expansion
  - Dual blazed wavelength
- Option for wireless spectrometer with built-in Wifi module.
- Wavelength range: 180-1100 nm.
- High SNR model: SNR of 500.
- Short exposure time model: 0.2 ms.
- High resolution model: 0.2 nm.
- SE3xxx/4xxx: high-speed FX2 CPU with high sensitivity sensor.
  - Short integration time (6  $\mu$ s).
  - Data transfer speed of 1ms/frame (max 0.8 ms/frame).
- SE2050/90/10: 2/4/8/16 pixel-binning option increases sensitivity.

## Recommended Models

Application	Model Name	Wavelength Range	Resolution	SNR	Exposure Time	Dark Noise	Dynamic Range	Thermal Stability
LED Test	SE-3/9/12 SE-3 FX2 SE-12 FX2	350-1020 nm	1.9 nm	330/500	100/1500/ 100/10 /6 μs	22/29	3000/3540	0.027 nm/°C
Display Detection	SE-3/12	380-780 nm	1.3 nm	330	0.1 ms	22	3000	0.027 nm/°C
Water Quality Analysis	SE-3	180-500 nm	1.9 nm	330/500	0.1 ms	22	3000	0.027 nm/°C
Air Analysis	SE-3/9	180-500 nm	0.2-0.6 nm	330/500	0.1/1.5 ms	22/29	3000/3540	0.015 nm/°C
Raman Detection	SE-3/5/12	790-1090 nm	1.1 nm	330/500	0.1/ 5/ 0.1 ms	22/20	3000/4400	0.015 nm/°C
Educational Requirement	SE-4	350-1020 nm	1.9 nm	200	1 ms	34	2220	0.027 nm/°C
Film Thickness Measurement	SE-3/9	180-1100 nm	3.2 nm	330/500	0.1/ 1.5 ms	22/29	3000/3540	0.039 nm/°C
Gem Stone Examination	SE-3	400-500 nm	0.5 nm	330	0.1 ms	22	3000	0.015 nm/°C
Food Analysis	SE-3	180-1100 nm	3.2 nm	330	0.1 ms	22	3000	0.039 nm/°C
Blood Analysis	SE-3/12	300-850 nm	1.9 nm	330	0.1 ms	22	3000	0.027 nm/°C
Fluorescence Detection	SE-3/8/12	340-850 nm	1.9 nm	330/350	0.1 /0.42 ms	22/50	3000/2200	0.027 nm/°C
OCT Application	SE-3/8	790-1010 nm	0.9 nm	330/350	0.1 /0.42 ms	22/50	3000/2200	0.027 nm/°C

## Specially Selected Models

Types	Model Name	Wavelength Range	Resolution	SNR	Exposure Time	Thermal Stability
Best-Sold Model	SE-3	350-1020 nm	1.9 nm	330	0.21 ms	0.027 nm/°C
Best CP Value Model	SE-4	350-1020 nm	1.9 nm	200	1 ms	0.027 nm/°C
Full Wavelength Range Model	SE-3/9	180-1100 nm	3.2 nm	330/500	0.21 / 1.5 ms	0.039 nm/°C
High SNR Model	SE-5/9	180-1100 nm	3.2 nm	500/500	5 / 1.5 ms	0.039 nm/°C
Short Exposure Time Model	SE-3/8/9/12	180-1100 nm	3.2 nm	330/350/500	0.21 / 0.42 / 1.5 ms	0.027 nm/°C
High Resolution Model	SE-7/8	400-500 nm	0.5 nm	400/350	4 / 0.42 ms	0.007 nm/°C

## Make A Spectrometer for Your Own Special Need

Groove Density (g/mm)	Best Efficiency Wavelength (nm)	Bandwidth	Selectable Band	Resolutions (nm) Under Different Slit Sizes					
				10 μm	25 μm	50 μm	100 μm	200 μm	300 μm
2400	240/VIS	100 nm UV 150 nm	180-520 nm	0.2	0.3	0.4	0.8	1.2	-
1800	180/250/500	150 nm UV 210 nm	180-700 nm	0.3	0.4	0.6	1.0	1.8	-
1600	200	160 nm UV 240 nm	180-780 nm	0.4	0.5	0.7	1.2	2.0	-
1200	200/300/500/600/750/850	220 nm UV 320 nm	180-1010 nm	0.5	0.6	0.9	1.7	3.4	4.5
1000	250/900	300 nm UV 400 nm	180-1100 nm	0.6	0.7	1.1	1.9	3.0	-
900	500	360 nm UV 450 nm	180-1100 nm	0.6	0.8	1.3	2.3	4.6	-
830	800	410 nm	180-1100 nm	0.9	1.0	1.5	2.5	4.5	-
600	300/400/500/800/1000	670 nm	180-1100 nm	1.0	1.2	1.9	3.3	6.7	10.0
500	300/560/770	825 nm	180-1100 nm	1.1	1.4	2.4	3.5	7.5	11.5
300	230/300/500/422	920 nm	180-1100 nm	1.7	2.3	3.2	6.0	12.8	20.0