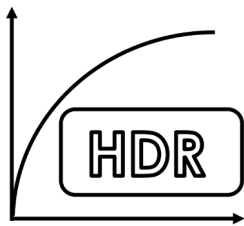


Emberion VIS-SWIR Portfolio

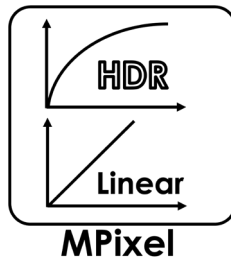
Preliminary Data Sheet

Sensor options



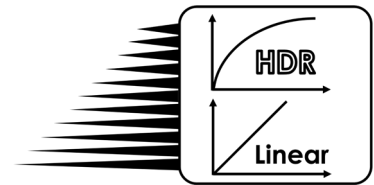
High speed VGA

Open circuit voltage mode sensor with very high dynamic range and logarithmic output



Dual mode Mpixel

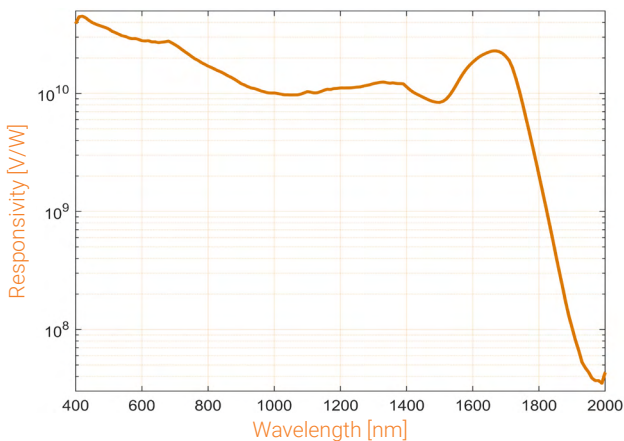
Unique dual mode 1.3 Mpixel sensor with both linear and logarithmic modes



Hyperspectral optimized

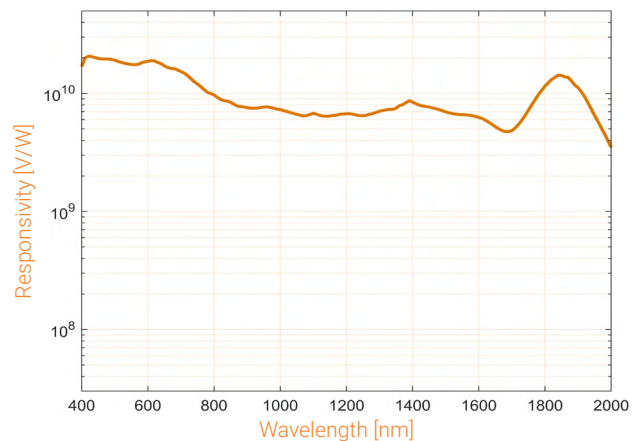
Designed for pushbroom hyperspectral sensing, dual mode operation

Quantum dots variants



Up to 1800 nm

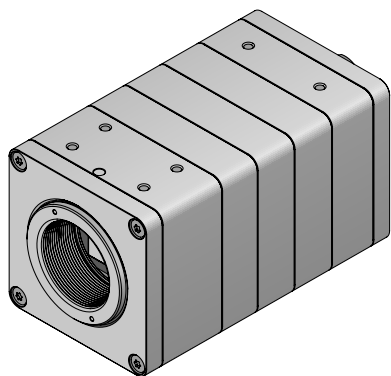
Optimized for plastic sorting



Up to 2000 nm

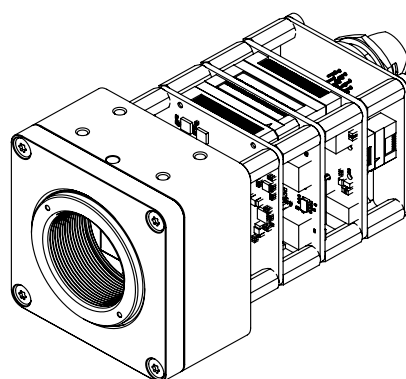
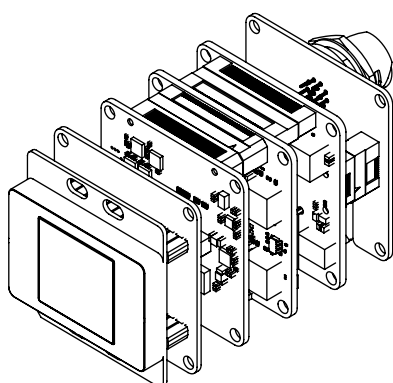
Best compromise for extended wavelengths

Delivery options



Compact camera

Emberion VS20 Compact is a fully certified industrial camera, interfaced with GigE vision



Core electronics

Emberion VS20 Core comprises of Emberion VIS-SWIR sensor, PCBA and optional accessories, tailored to various of integration needs

Sensor specifications	High speed	Dual mode MPixel	Hyperspectral optimized
Image sensor type	Emberion colloidal quantum dot (CQD) photodiode		
Spectral range	400 to 2000 nm		
External Quantum Efficiency ¹	20% at 1850 nm		
Pixel size	20.0 μm x 20.0 μm	10.0 μm x 10.0 μm	50.0 μm x 20.0 μm (configurable)
Resolution in pixels	640 x 512	1280 x 1024	204 x 640 (configurable)
Frame rate	400 fps	100 fps	1000 fps with 204 spectral lines
Dynamic range ²	> 120 dB	>100 dB (HDR), >70 dB (linear)	>100 dB (HDR), >70 dB (linear)
Dark current ³ at 5 °C	No I_{dark}	< 0.5 pA	<2 pA
Noise Equivalent Power	40 fW ($T_{\text{exp}} = 10$ ms):	10 fW ($T_{\text{exp}} = 10$ ms):	0.1 pW ($T_{\text{exp}} = 1$ ms)
Noise Equivalent Irradiance	10^{-4} W/m ² (NEI = NEP/A _{pixel})		
Saturation current density (J_s)	0.1 $\mu\text{A}/\text{cm}^2$ at 5 °C		
Shutter type	Global electronic		
Exposure time	Min 0.1 ms, adjustable with 1 μs resolution		
Duty cycle	90% with 100 μs exposure		
Read-out modes	Integrate While Read (IWR) & Integrate Then Read (ITR)		

1 External quantum efficiency (EQE) and the spectral response depend on optimisation for wavelengths of interest.

2 Dual mode sensor can be used in linear or alternatively in high-dynamic range (HDR) mode. Dynamic range depends on the measurement mode.

3 Dark current is related to linear mode while using HDR mode the diode saturation current influences the optical power to voltage responsivity. Thus, the best way to compare the noise performance of different modes is to look at noise equivalent power (NEP) or noise equivalent irradiance (NEI)