

X-Scan ME3 series

Multi-energy X-ray line cameras



- Simplifies multi-energy X-ray system designs
- Scales to various system configurations
- Improves object detection rate, image quality, and material analysis
- Enables high penetration and high scan speeds up to 96 m/min
- Features robust water- and dust-resistant housing, and reliable mechanical and electrical interfaces
- Comes with a built-in liquid cooling circuit
- Enables straightforward and smooth system integration
- Supports easy serviceability



The X-Scan ME is a complete product family of ready-made photon-counting line cameras and critical detector accessories that are designed for harsh industrial environments. The series is an ideal solution for the sorting, grading, quality inspection, material analysis, and optimization of complex manufacturing processes in recycling, food processing, mining, and other process industries. The X-Scan ME is a perfect fit for high-tier industrial applications that require material discrimination capability beyond conventional dual-energy configurations, yet seek robustness, easy system integration, and serviceability for greater scanning performance and end-user experience.

The X-Scan ME is equipped with a precise sensor gap and alignment control, which results in a seamless detector array to avoid missed objects and image distortion, and to enhance material analysis for reducing false alarm rates and waste. This spectroscopic detector family comes with VHF (very high flux) configuration to enable the utilization of high X-ray power for the penetration of large or dense objects, and higher scanning speeds.

Application-optimized direct conversion sensors and embedded digital signal processing algorithms boost the performance of the X-Scan ME series. The series is powered by unique X-Card ME3 XC detector boards to meet the special requirements of the target market. X-Card ME3 XC features doubled photon-counting capability up to 4 Mcps/px (mega counts per second per pixel) as linear range, and over 7 Mcps/px as full range compared to the previous detector board generation.

In addition to multi-energy mode, the X-Scan ME has an effective energy range of 20 to 160 keV with configurable photon counting modes for making it easy to utilize the advantages of powerful multi-energy technology for multi-purpose scanning needs. These simple configurations are targeted at applications that require accurate and extremely low-noise data at fast scanning speeds.

The series is built on an easily scalable and modular platform to be a perfect fit for a wide range of conveyor belt widths and object sizes. The X-Scan ME is available in up to 1.2-meter length options and with different connectors. It features robust, IP67-classified housing, and reliable mechanical and electrical interfaces. It has a built-in liquid cooling circuit for contaminant-resistant and reliable detector thermal management. The overall cooling system utilizes industrial chillers, the output of which can be directed entirely to the cooling of X-Scan ME, or shared with an X-ray source cooling system.

The X-Scan ME comes with an application-fitted and robust control unit, the X-IM ME3-H, and a power supply. Furthermore, an application-programming interface (API) tools and software development kit (SDK) support straightforward detector integration to X-ray scanners.

Key features

- Ready-made line camera series with proven ME sensors, X-Card ME3 XC
- Several detector length and connector options
- Precise sensor gap and alignment control with 0.8 mm native pitch
- Very high flux configuration with doubled photon-counting capability
- Effective energy range at 20 to 160 keV with configurable photon counting modes
- IP67-classified enclosure
- Liquid cooling system
- Optimized control unit in a separate housing, X-IM ME3-H
- API and SDK tools
- CE compliant

Applications

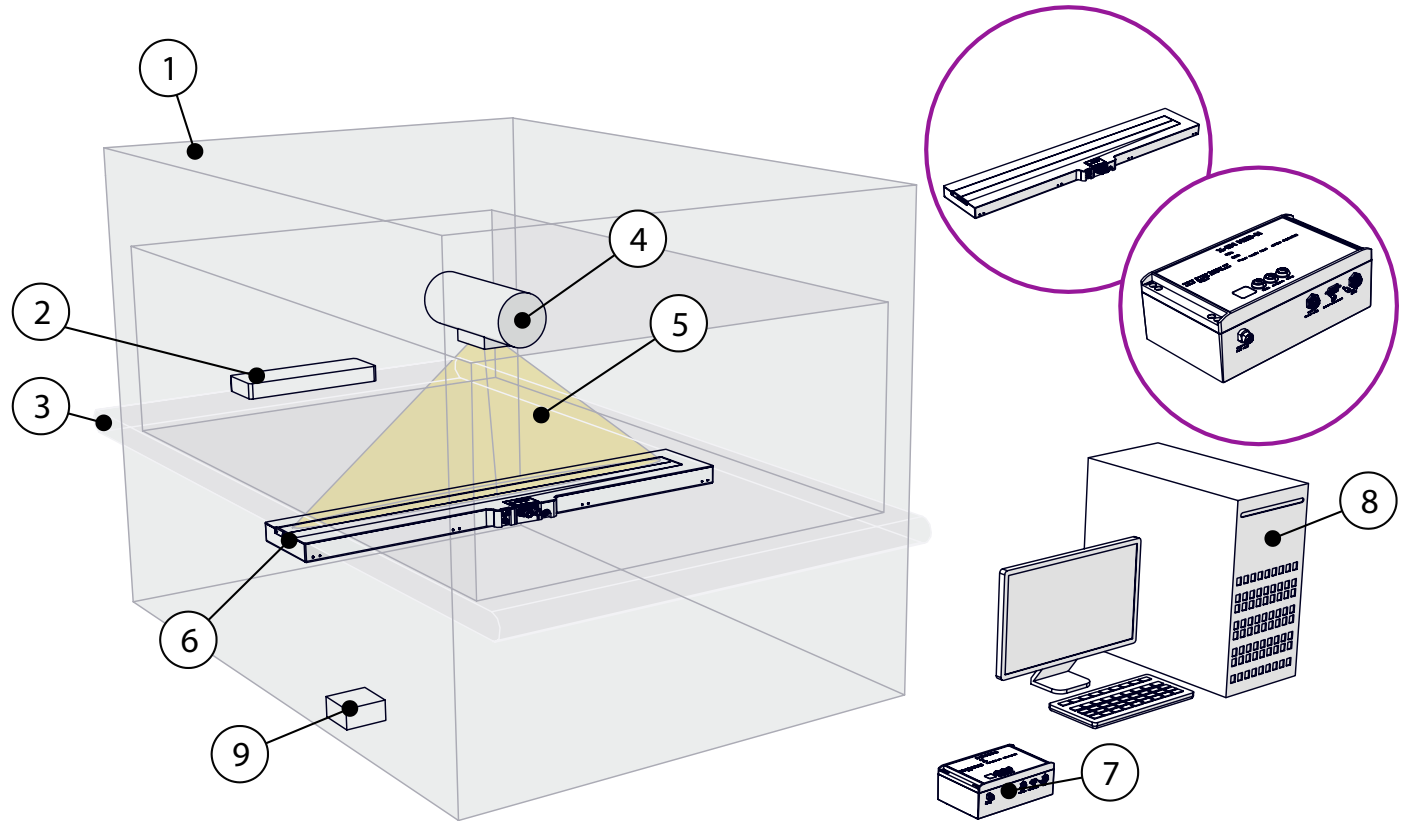
- Sorting, grading, quality inspection, material analysis, and optimization of complex manufacturing processes in high-tier recycling, food processing, mining, and other process industries.

Mechanical dimensions

FEATURE	X-SCAN ME3081229A	X-SCAN ME3081229B	X-SCAN ME3080410A
Detection method	Direct conversion, photon counting		
Semiconductor type	CdTe		
Crystal thickness	2 mm		
Detector element pitch	0.8 mm		
Detector element binning	1x1 (0.8 mm pitch); 2x1 (1.6 mm pitch)		
Active area length	1229 mm (1536 pixels)	1229 mm (1536 pixels)	410 mm (512 pixels)
Energy range	20 – 160 keV		
Linearity	$\geq 83\%$ @ $4 \cdot 10^6$ counts/s/pix		
Count rate saturation	$> 7.0 \cdot 10^6$ counts/s/pix		
Energy resolution (FWHM)	7.7 KeV @ 60 keV (10^5 counts/pix/s)		
Line speed	4 m/min to 96 m/min		
Counting period	0.5 ms to 100 ms (with step of 10 μ s)		
Energy bins (channels)	Up to 128 in HER mode / 2 - 8 independently configurable in BIN mode		
Pixel dynamic range / energy bin	16 bits per bin in HER mode / 32 bits per bin in BIN mode		
Power supply	Voltage 48 V DC		
Power consumption	425 W	425 W	140 W
Cooling medium flow & pressure	5 l/min @10 PSI		
Interface, detector module to control unit	ME-link protocol with Cat7 cable, IP67 M12X connectors		
Interface location (power, data, cooling)	Long side, center	Short side, detector end	Long side, center
Interface, control unit to host computer	Gigabit Ethernet, Cat7 cable, M12X-RJ45 connectors		
Enclosure dimensions	1332 x 284 x 54 mm	1347 x 242 x 54 mm	512 x 284 x 54 mm
Weight	25 kg	25 kg	15 kg
EMC compliance	EN 61326-1, EN 61000-4-2, EN 61000-4-3		
RoHS compliance	Yes		

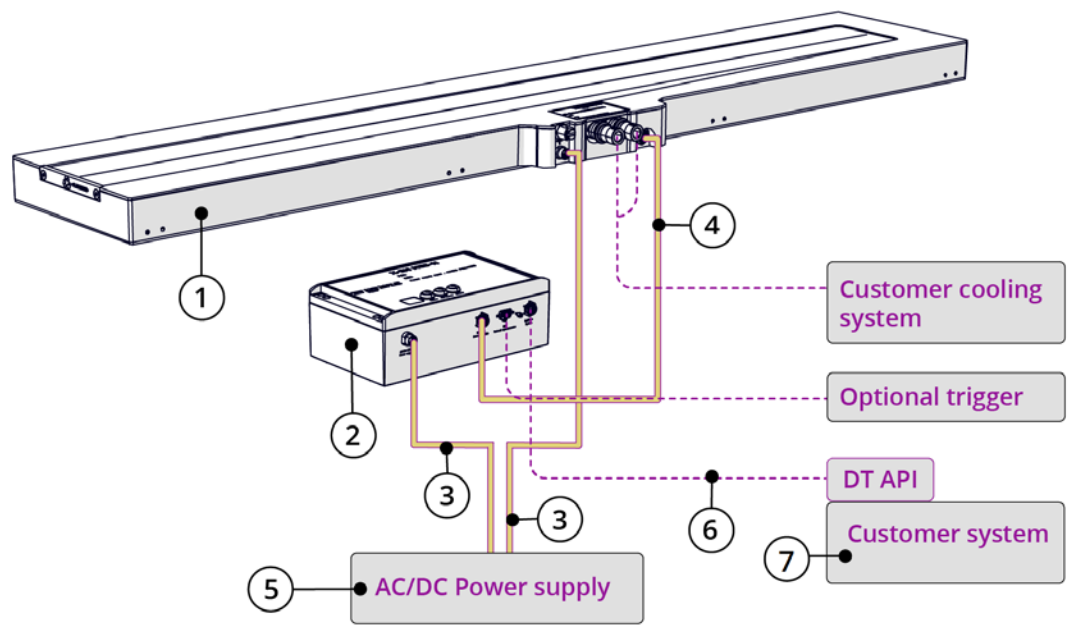
Typical application of an X-Scan ME3 linear detector.

NO	NAME
1	Closed inspection system cabinet and radiation shielding
2	A tray to place object to be inspected (optional)
3	A conveyor, over which the object is transported across the detector's field-of-view
4	An X-ray source with a control system
5	Fan-shaped X-ray beam
6	An X-Scan ME3 linear detector array
7	An X-IM ME3-H interface module
8	A computer equipped with a Giga-bit Ethernet port
9	Thermal control, chiller or equivalent

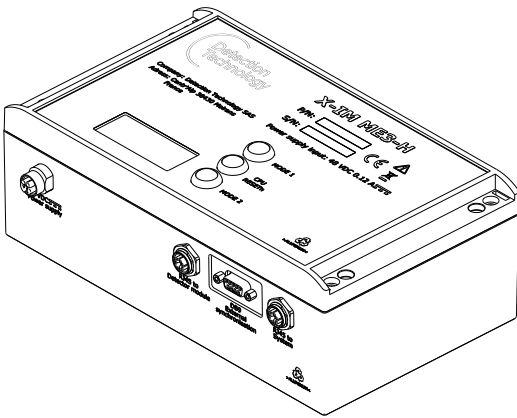


Building blocks of ME3 detector.

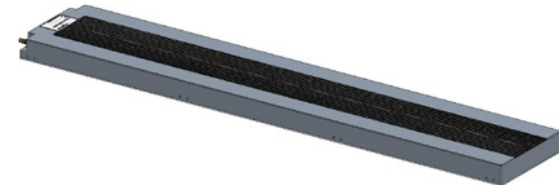
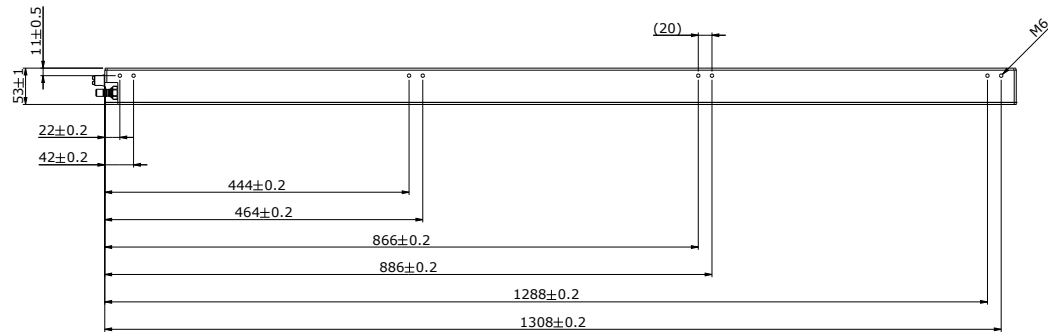
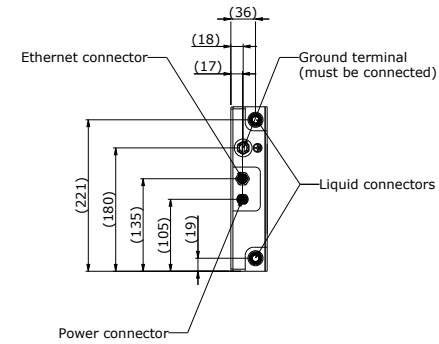
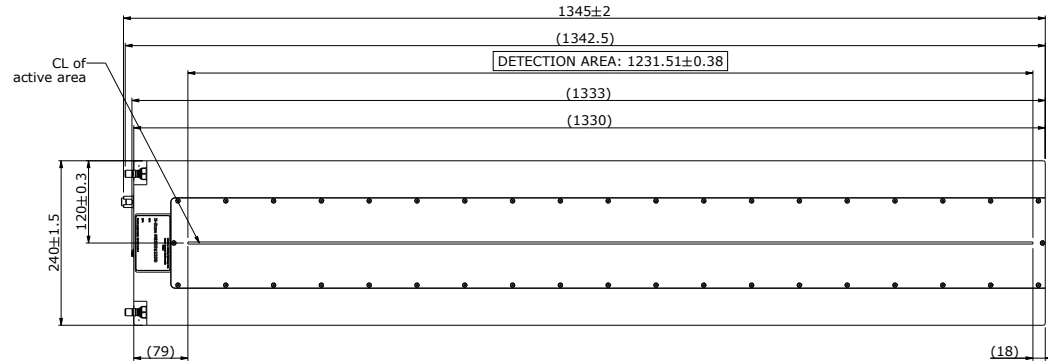
NO	NAME
1	X-Scan ME3
2	X-IM ME3-H
3	Power link
4	High speed link
5	AC/DC power supply
6	GigE vision link
7	Acquisition system including DT API



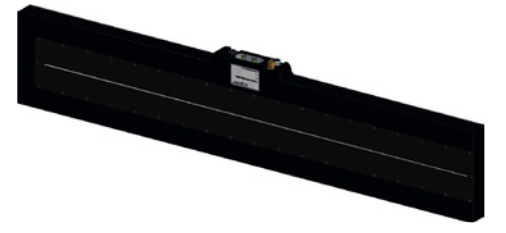
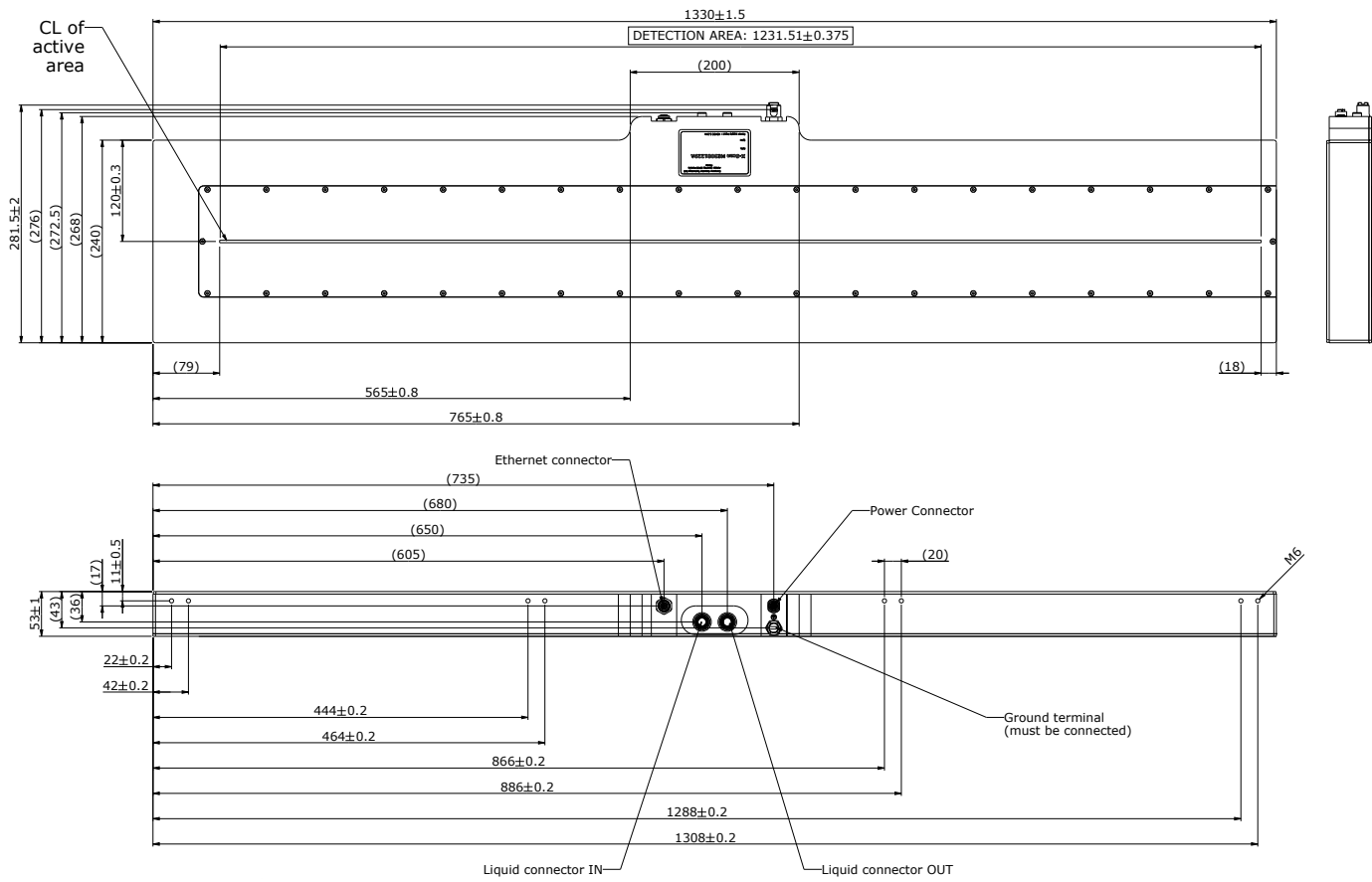
X-IM ME3-H. An application-fitted and robust control unit.



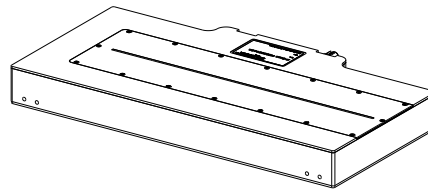
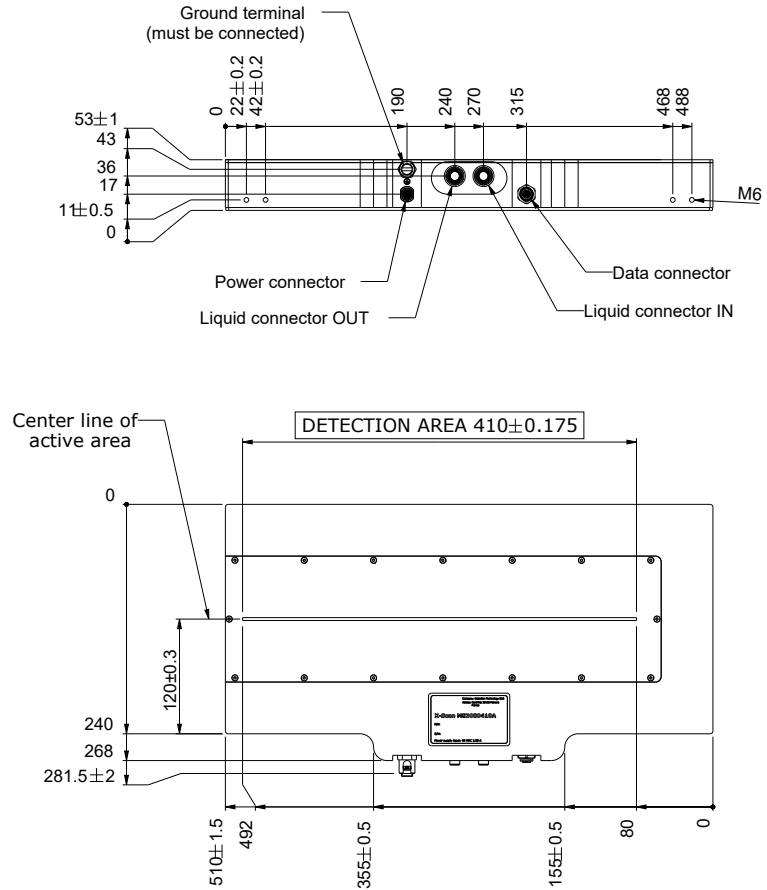
X-Scan ME3081229B outline



X-Scan ME3081229A outline



X-Scan ME3080410A outline



X-IM ME3-H outline

