X-Scan F01 series

Modular linear array detectors

- Efficient material separation by dual energy and optimized sensors
- Accurate object detection by extremely fast and sensitive scintillator materials
- Enhanced multi-view systems supported with a single controller unit
- Modular design easily scalable
- Optimized detector structure for target applications
- Possibility to balance resolution and contrast by pixel binning function
- Various detector lengths enabling also inspection of large objects with a single unit
- Fast scanning speed, up to 8 m/s belt speed
- Robust data transmission and fast synchronization between detector units and a system computer
- Enhanced diagnostic functions

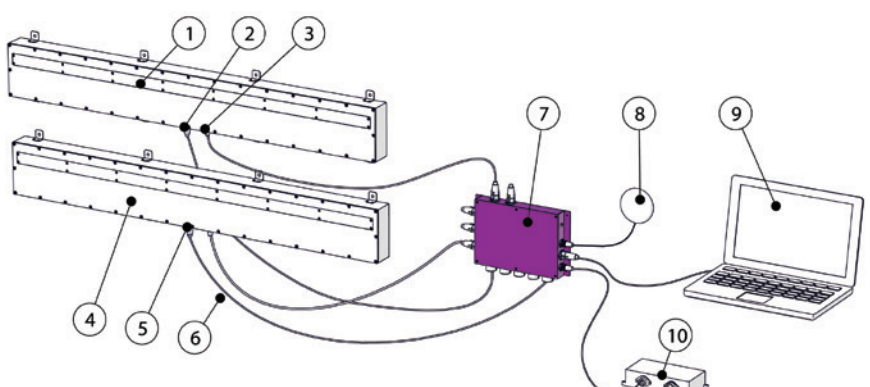
X-Scan F series is a product family of high-resolution X-ray line cameras designed for accurate and fast-paced quality inspection, and the grading and sorting of raw materials. X-Scan F enables the superior material separation capability with a dual energy imaging functionality and optimized sensors.

The series comes with a single controller unit supporting enhanced multi-view systems. The series utilizes extremely fast and sensitive scintillator materials providing the most accurate object detection. A pixel binning function embedded in the linear array detectors also makes it possible to balance the resolution and contrast of X-ray images.

The plug-and-play type X-Scan F series is built on a modular platform making it easily scalable to various system configurations. Several different detector lengths are also available allowing the inspection of large-scale objects with a single line camera.

The X-Scan F series is based on a new generation digital platform providing over two times faster scanning speeds and quick data synchronization between the detector unit and a system computer. The series has a Gigabit Ethernet interface and enhanced diagnostic functions.

A typical X-Scan F01 setup



X-Scan F01 module	1
Power 1	2
X-Link 1 (Circular RJ45)	3
X-Scan F01	4
Power 2	5
X-Link 2 (Circular RJ45)	6
X-GCU control unit	7
Trigger (optional)	8
PC (via GigE), DT X-Lib	9
AC/DC power supply	10

Key features

- Single and dual energy options
- X-ray energy range: 40–225 kVp
- Pixel pitches: 0.4, 0.8 and 1.5 mm
- Active area lengths: From 307 up to 1638 mm
- Dynamic range >16,000
- Gigabit Ethernet interface
- Diagnostic functions
- Easy software design based on DT X-View2 software and development kit for Windows and Linux

Applications

- Recycling, metal sorting
- Sawmilling and mining, inspection and grading of raw materials
- Food industry, grading of ingredients and quality controlmining, oil and gas

General characteristics

Product	X-Scan F0104	X-Scan F0108	X-Scan F0115
X-ray tube voltage Vp range	40–160kVp		Single energy, B models: 40–160kVp Single energy, C models: 80–225kVp Dual energy, D models: 120–225kVp
Scintillator material	GOS screen		Single energy, B models: GOS screen Single energy, C models: Ceramic Dual energy, D models: Fast GOS & Ceramic
Active area lengths, single module	307, 410, 512, 614, 717, 922, 1229 mm		672, 1152, 1344, 1442 mm
Total pixel number per module	768–4096	384–2048	Single energy: 448, 768, 896. Dual energy: 896,1536,1792
Maximum number of modules and active length with one XGCU EX-PH control unit	5 modules, 3890 mm	5 modules, 8190 mm	5 modules, 6720 mm
Pixel size (photodiode)	0.3 x 0.6 mm	0.7 x 0.8 mm	1.4 x 3.2 mm
Scanning speed			
Maximum scanning speed	2 m/s	7 m/s	Single energy: 5 m/s. Dual energy: 2.5 m/s
Integration time range	0.12...128 ms	0.10...128 ms	0.58...128 ms
Line averaging and summing	Yes, up to 256x		
Pixel binning	Yes. 1, 2 or 4 pixels		
A/D resolution	16 bits		
Overall X-ray response non-uniformity, dark offset subtracted at detector level	< ±25 %		
X-ray response linearity	>99 %		
Max number of dead pixels	Zero, no dead pixels		
Channel electronic crosstalk	< 0.5 %		
Dynamic range	>16 000:1 depending on sensitivity settings		
Sensitivity settings	Range 0.875..12.25 pC with 1.75 pC steps (8 settings)		Range 7.5..84 pC with 7.5 pC steps (12 settings)
Interface, detector module to control unit	X-Link protocol in Cat5e cable with RJ45 connectors		
Interface, control unit to host computer	Gigabit Ethernet, UDP protocol		
EMC compliance	EN61326-1, EN61000-3-2, EN61000-3-3		
IP classification	IP55		
RoHS compliance	Yes		
Operational voltage and power	24 VDC, max 35 W per module. Industrial power supply units available from DT		
Operational temperature and humidity	0–40 °C, 30–80 % (non-condensing)		
Storage temperature	-10–50 °C		
Lifetime under X-ray	typical 100 kGy		
Weight per module	5 to 40 kg		
Power on time recording	Yes, up to 100 000 hours		

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Detection Technology