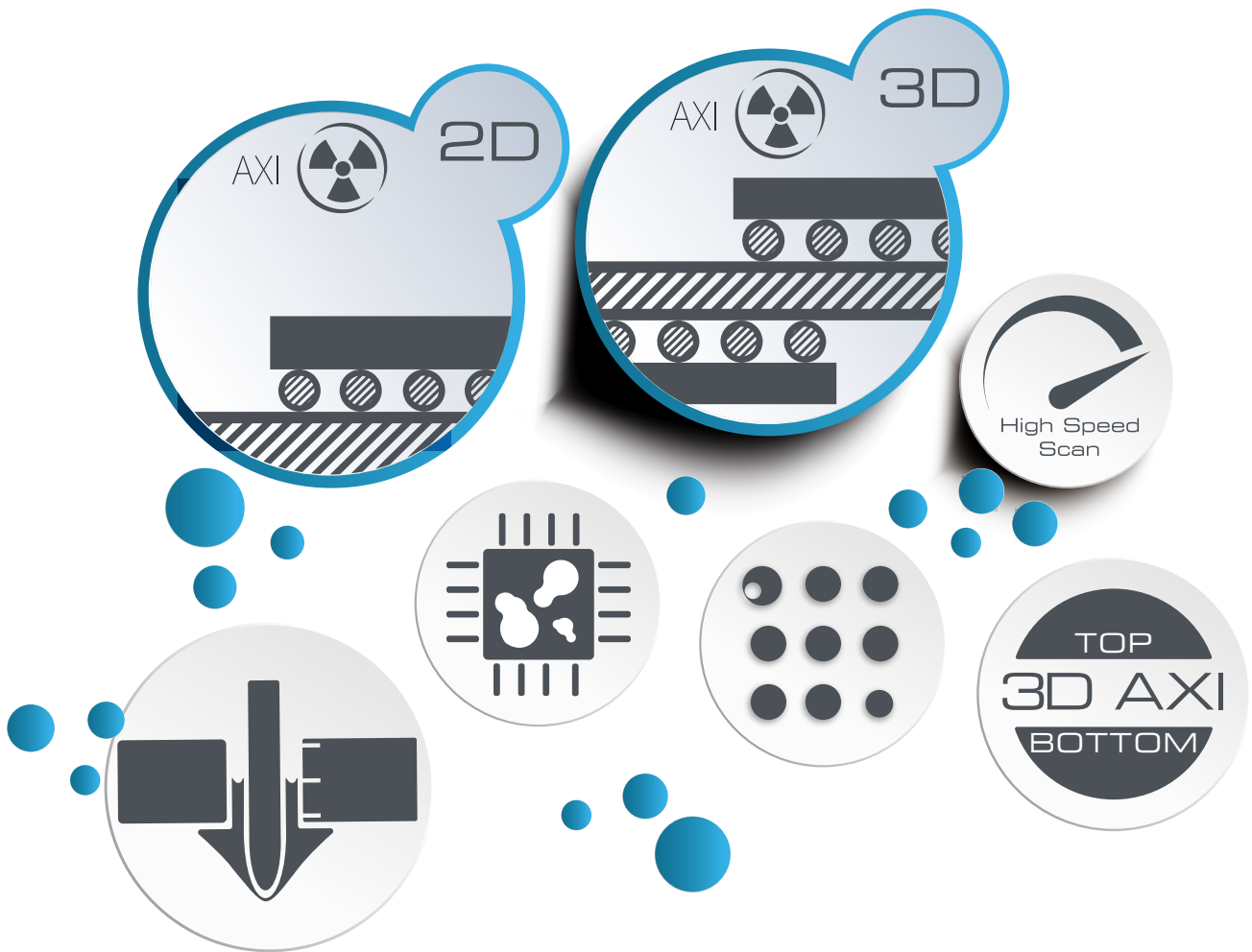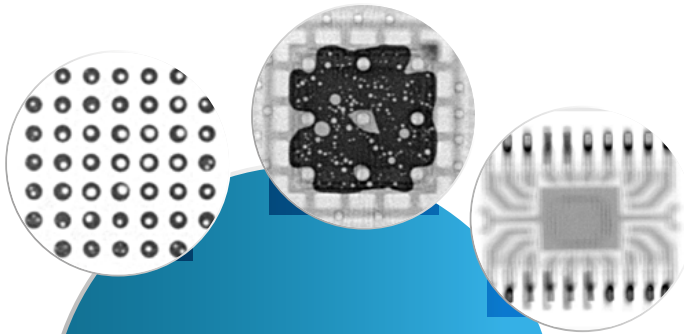# AXI · Technology

X-ray inspection   X Line · 3D, X Line · 2D

· 3D X-ray inspection of double sided assembled PCBs
· 2D X-ray inspection of single sided assembled PCBs
· fast PCB handling (5 seconds)
· low-maintenance system concept
· IPC-orientated inspection
· MES connection via plug-ins

AXOI testing concept

AXI · X-ray inspection

· all-over solder joint check using 3D AXI for IPC-compliant checking of solder joints

· hidden and visible solder joints are reliably tested using 3D AXI
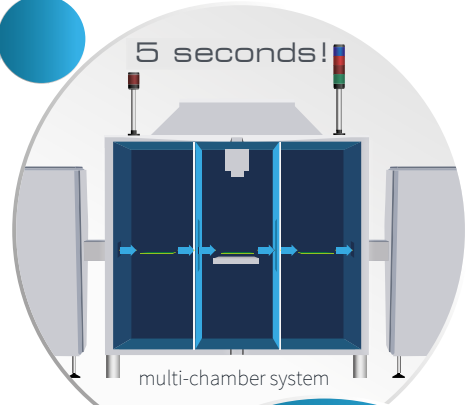
AOI · optical inspection

· test tasks that cannot be performed with 3D AXI are covered by optional AOI module

· polarity, OCR, colour recognition, code reading, selective solder joint inspection
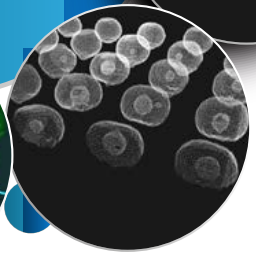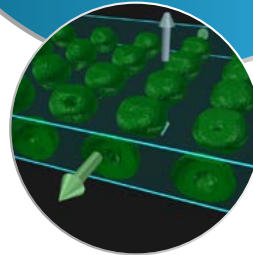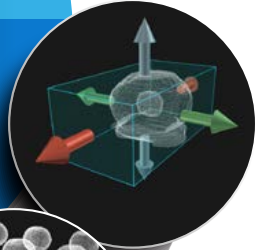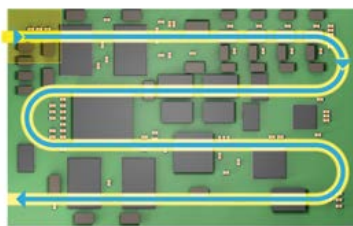
Digital maintenance app

· Digital maintenance plan

· Usage-based maintenance

· Predictive maintenance based on meters

Fast 3D image capture

· fast 3D X-ray image capture in motion

· scanning image capture enables X-ray inspection of complete PCB

· 3D X-ray image reconstruction for inspection of the assembly layer by layer
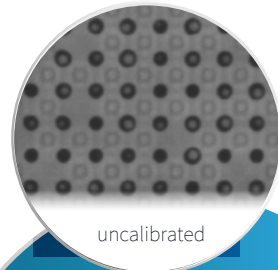
scanning X-ray image capture

5 seconds!

multi-chamber system

Fast PCB handling

· using a multi-chamber system with double shutters

· parallel loading, inspection and unloading
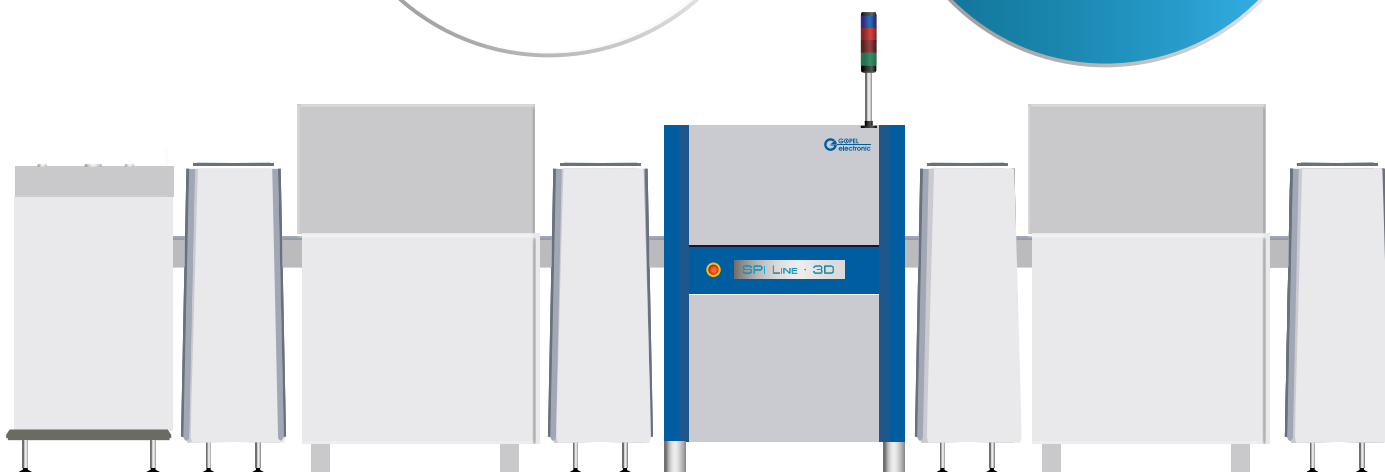
Unique detector
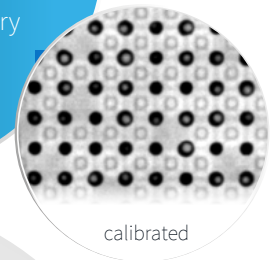
· multi-angle detector (3rd generation) with extremely high operating life

X·Line·3D

3D 3D 3D

3

MULTI ANGLE
DETECTOR 3

uncalibrated

Calibration

· complete geometric and grey-value calibrated
· no distorted X-ray images
· uniform component library can be used

calibrated

Typical applications

· BGA inspection
· QFN, DFN and LGA inspection
· void inspection
· inspection of the rear solder meniscus of gullwing pins
· full inspection of the two menisci on J-lead pins
· THT/THR barrel fill, solder volume
· inspection of multiple assembly levels (package-on-package, piggy-back modules)

automatic compensation of PCB warpage
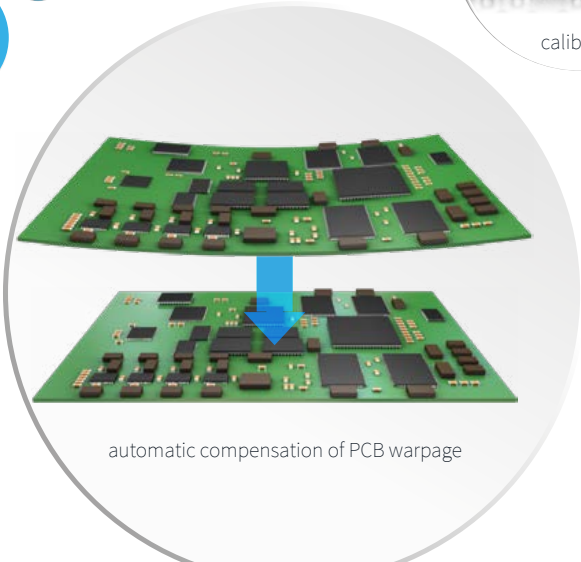
System usage

· as an island system (offline) or directly in the production line (inline)

island · offline

verification

line · inline

X·LINE 3D

PILOTVERIFY
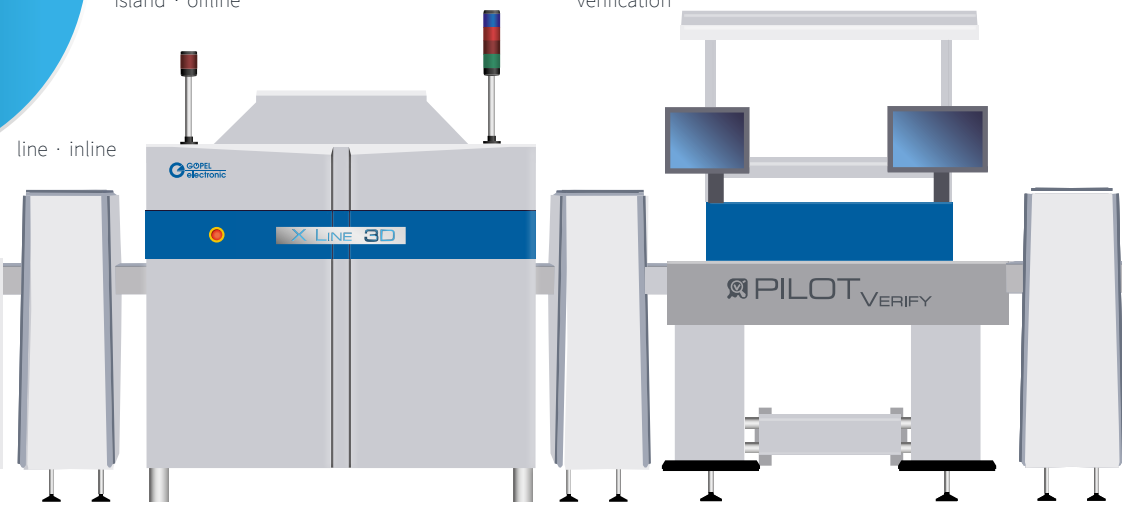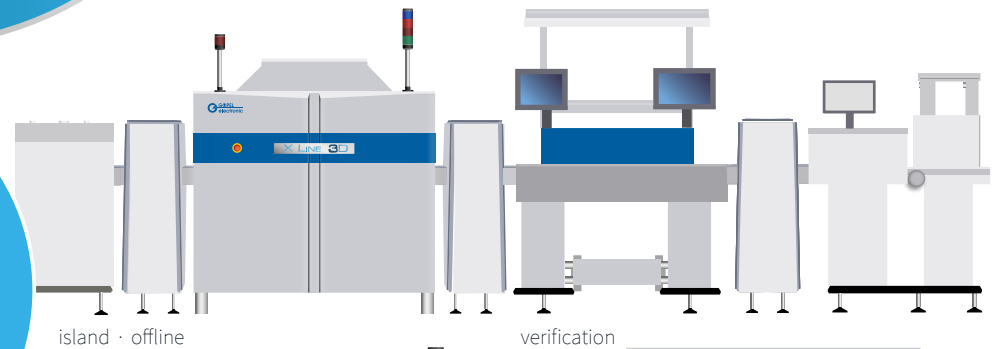
PILOT AXI software

PILOT AXI software

· fast and intuitive creation of test programs with test program wizard
· AXI component library
· data import functionality (ODB++, GenCAD, Gerber, pick and place)
· integrated debugging statistics for fast optimisation of inspection programs
· full offline programming away from the production line
· intelligent data management for storing test results
· MES interfaces via PILOT Connect (bidirectional, unidirectional)

· THT/THR barrel fill inspection

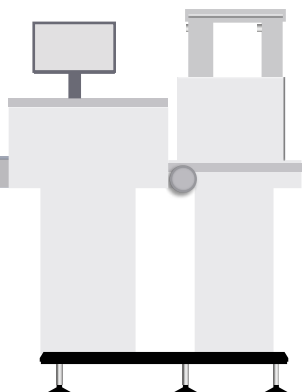· 3D X-ray inspection of face-to-face assembly

PILOT Inspect

· intuitive operator software with apps
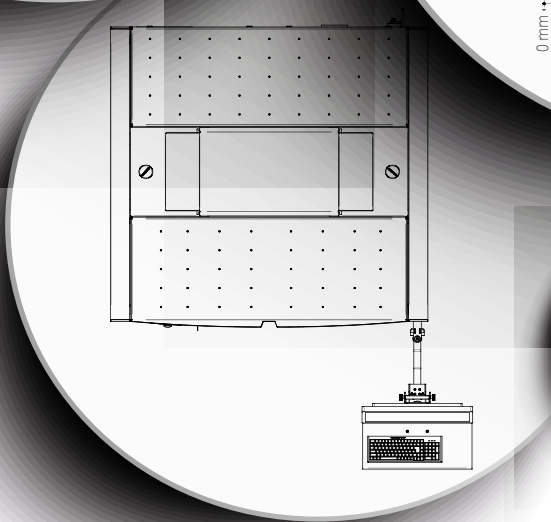· machine can be operated by touch

PILOT Connect software
all the data stored central

· connection of all the inspection data from SPI, AOI and AXI
· repair station with a clear visualisation of the AOI , AXI and SPI test results at the same time
· opportunities for process analysis and optimisation by statistically linking of the inspection data
· interfaces to MES and traceability systems
· integration of external inspection systems
· integrated user management for all related systems and software modules
· data maintenance tools

ORACLE   MySQL   Microsoft SQL Server

1553 mm
1693 mm

1496 mm
1596 mm

950 mm

140 mm

1330 mm
1553 mm
1693 mm

0 mm
160 mm
330 mm

1460 mm
1590 mm
1632 mm
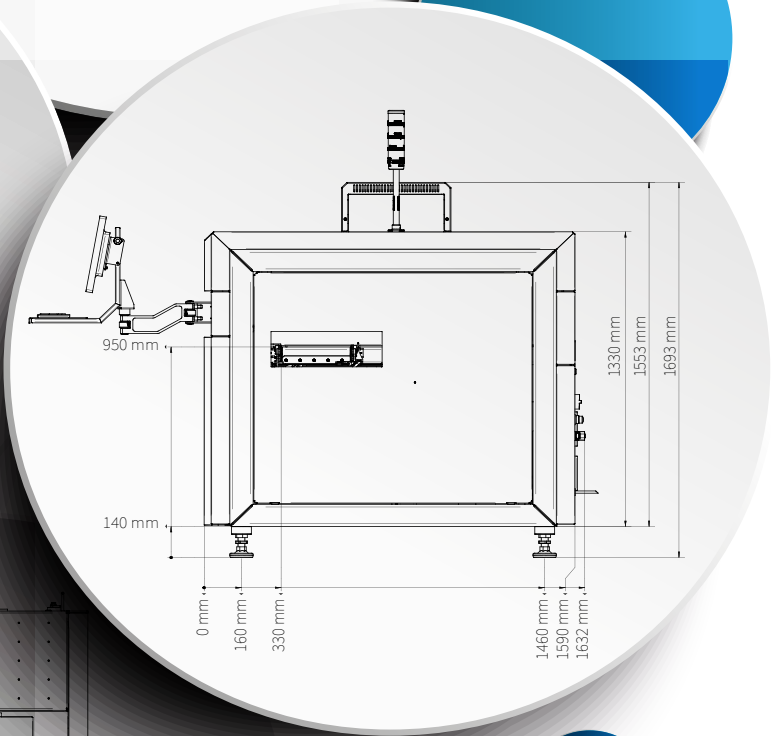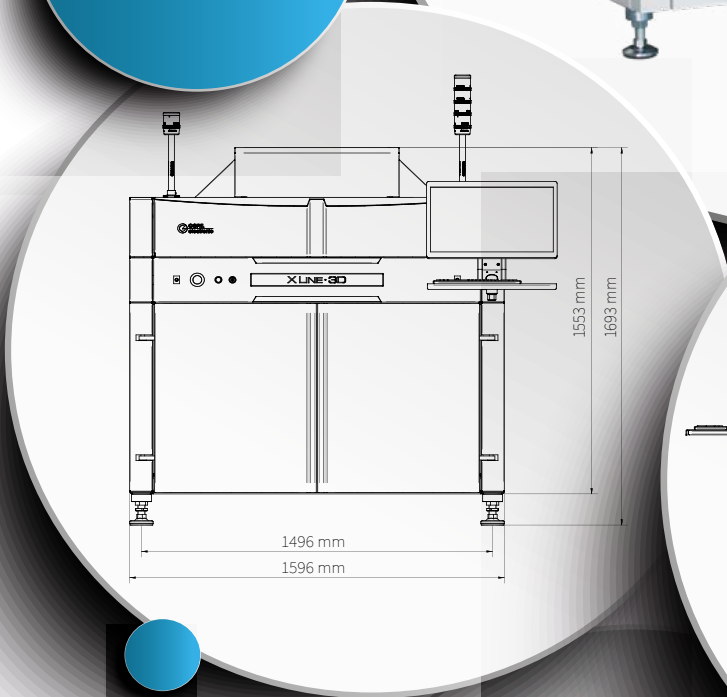
Models

versions	X Line · 3D
	X Line · 3D

System

inline interface	SMEMA, Siemens, HERMES
device connections	230 VAC, 1.4 kVA, 6 bar compressed air, < 25 Nl/min *
dimensions (w x d x h)	base unit: 1596 mm x 1540 mm x 1470 mm
	device with tube tower: 1596 mm x 1540 mm x 1720 mm
weight	approx. 2.6 t

PCB handling

transport height	850 mm ± 25 mm 950 mm ± 25 mm
width adjustment	automatic
PCB size (l x w)	max. 435 mm x 400 mm
	min. 60 mm x 50 mm
PCB thickness	0.5 mm – 4 mm
PCB edge clearance	≥ 3 mm
PCB weight	≤ 1.5 kg, optional 5 kg
PCB warpage	automatic compensation (laser)
component clearance of PCB	below: 65 mm
	above: max. 40 mm **
handling time	approx. 5 s (parallel loading/ unloading and inspection)

* referring to 45 sec cycle time, ** depending on detail resolution

X-ray technology

tube type	maintenance free, sealed micro-focus X-ray tube
tube voltage	max. 130 kV
tube current	max. 300 µA
tube output	max. 39 W
detector type	MultiAngle Detector 3, real-time image capture from different angles
grey-scale resolution	12 bits
detail resolution	up to 6 µm* (typical 10 – 15 µm)
3D inspection speed	up to 100 cm²/s
calibration	geometric and grey-value calibration
z-axis adjustment	customisable geometrical magnification by means of motorised vertical positioning of the tube
X-ray protection	in accordance with the German X-ray Ordinance RöV, three segments, radiation-proof

* depending on upper component clearance

:Made in Germany

GÖPEL electronic
Enjoy Testing

ISO 9001 certified