

45X G4

Mass Production System for 3D Printed Electronics

The 45X G4 is a compact, high throughput, mass production system for 3D Printed Electronics. This patented platform combines high performance print and assembly technology with industrially proven motion and software controls that enable the manufacture of complex mechatronic devices. With 4 print or assembly heads and 5 axes of simultaneous motion, rapid parallel processing of multiple parts is achieved.

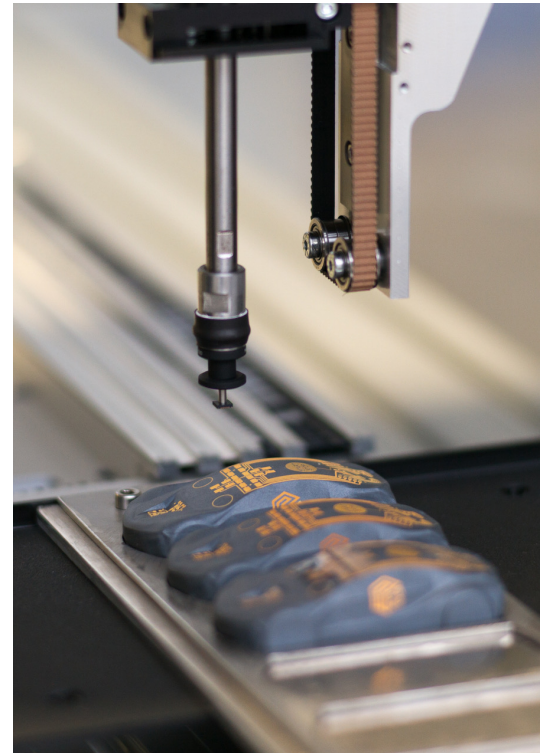
Designed specifically for 24/7 operation the 45X is robustly constructed for minimal maintenance operation. The base platform consists of a hard rock granite portal and rigid steel frame that provide high damping, anti-vibration, thermo stability and compressive strength for long-term-stability.

Linear motor and encoder technology guarantee maximum printing accuracies ($\pm 5\mu\text{m}$) even at high-dynamic feed rates. High speed ($<1\text{ms}$) motion control and simultaneous calculation for axis positioning enables rapid and consistent print speeds enabling optimised print cycle times. “Look Ahead” path control with jerk compensation ensures harmonious movement and sinusoidal accelerations that guarantee printing accuracy.

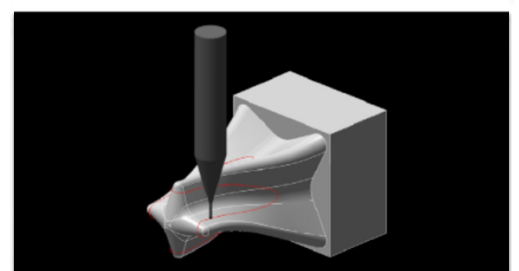
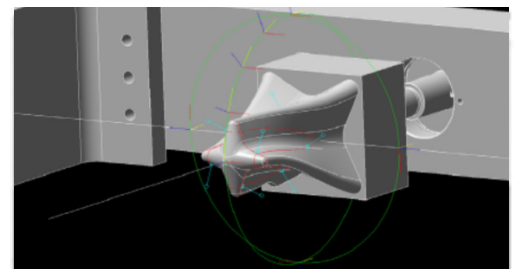
Motion 3D Tool-Path Software

The 45X is supplied with Neotech’s Motion 3D tool-path software. This novel CAD/CAM solution, specifically configured for 3D printed electronics, generates the machine code allowing indexed 3+2, 4+1 and simultaneous 5 axis printing with advanced Tool Centre Point operation. This software allows the user to implement the most effective print strategies for rapid processing of even the most complex designs. Print simulation and the CAM Check functions highlight potential errors before printing commences.

The combined Motion 3D and 45X system package provides a single unified solution to ensure rapid success of customer projects. The print systems are future secure operating with the standardised CANopen communication protocol.



SMD Pick & Place in the 45X Print Platform



Tool-path creation and simulation

Print Modules

The print modules, selected to meet applications requirements, include high speed piezo-driven drop-on-demand, ink jet or aerosol processes. This supports processing of a wide range of electronic materials from fluid nano-particle inks through to high viscosity (to ca. 200.000mPas) pastes. Printable materials include all electronics functions: conductors, dielectrics, adhesives, dopants and etchants enabling wide range of applications.

System Features

- Simultaneous 5 axis or indexed printing (X/Y/Z linear + A & B rotational) with free definition of the print sequence to optimize cycle times
- “Motion 3D” tool path generation software for printing complex geometries
- Tool Centre Point mode for consistent print velocities on variable curve surfaces
- Line, contour and area fill with arbitrary geometry with automatic island recognition
- Virtual simulation of the printing path
- Editing possibility for the NCP/G-Code data
- Robust, low maintenance platform with industrially proven CNC technology
- Simple operator interface with remote service via Team Viewer

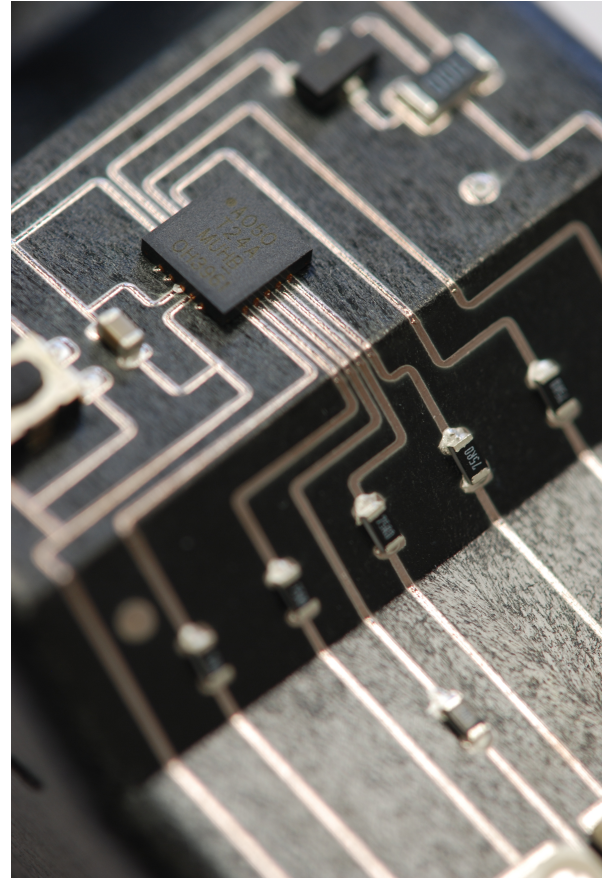
Specification (Motion Module)

- Print Speed: 1000 mm/s max.
- Motion Range: 600 x 500 x 250mm (X-Y-Z).
- Motion Accuracy: X, Y and Z – Axes +/-5µm
- Repeatability: X, Y and Z – Axes +/-2µm
- Positioning accuracy (A & B)– < 1,5 arcmin
- Repeatability (A & B) – < 6 arcsec
- Stand alone system dimensions (X-Y-Z)
1400 x 1055 x 2165mm plus control case
- Stand alone system weight ca. 1250kg

Utilities Required

- Electrical: 400V AC, 50-60Hz, 26A and Circuit Protection C32AH400V
- Compressed Air: 8 bar minimum

Additional utilities may be required dependent on print head selection



3D MID Demonstrator