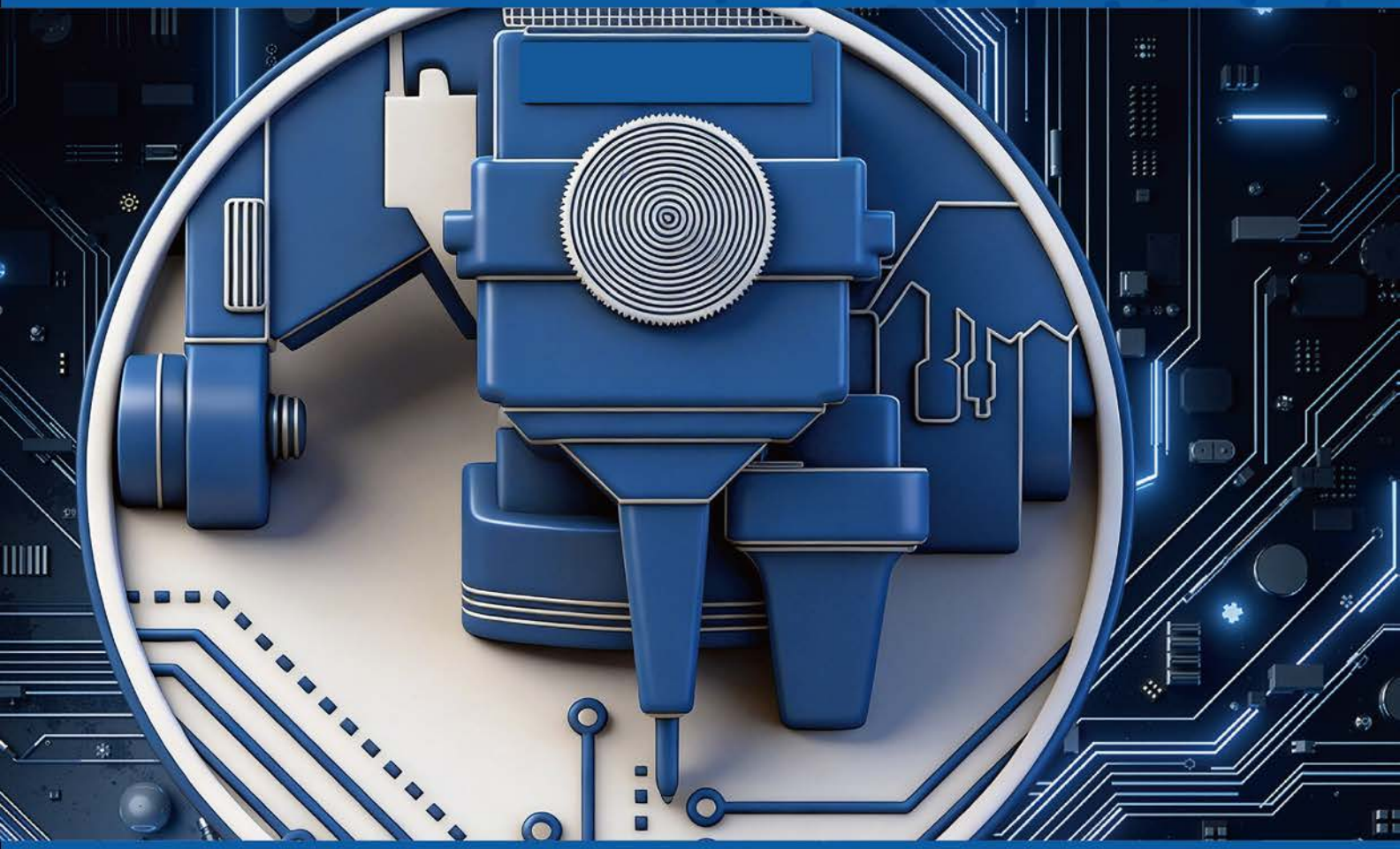
OPTOMEC®

AEROSOL JET FOR EDUCATION

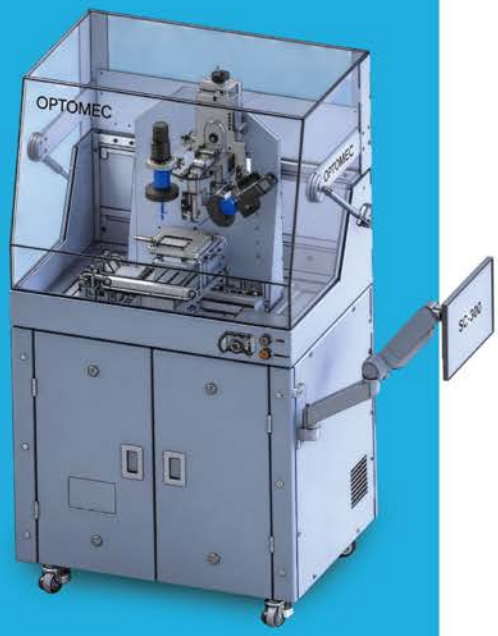
WHERE IDEAS BECOME INTELLIGENT DESIGN



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HARDWARE OVERVIEW

A comprehensive Aerosol Jet learning platform complete with hardware, software, consumables, fixturing and curricula designed to prepare and shape Potential Careers in Electronic Design and Manufacturing Using 3D



- Optomec newly designed Aerosol Jet printer with ready-to-teach curriculum designed to support hands-on learning in electronics manufacturing. The package includes semester- or quarter-based student consumables, laboratory fixtures, comprehensive built in lab exercises, and an instructor and teaching assistant guide.
- This platform enables universities and technical institutions to quickly deploy a complete electronic laboratory environment without the need for extensive lab development. The expandable, module-based lab structure allows institutions to introduce foundational concepts while providing a pathway for more advanced coursework as programs grow.
- The education bundle is designed to deliver measurable electronic learning outcomes by enabling students to design, print, post-process, and measure functional analog electronic devices within the Module One curriculum. Through hands-on laboratory exercises, students gain practical experience in printed electronics, and exploring other functional devices using a range of conductive and dielectric material inks. The curriculum also introduces post-process measurement, testing, and validation techniques to reinforce engineering principles and ensure students achieve clearly defined learning outcomes that can be aligend with traditional course requirements.
- Optomec's comprehensive learning platform features built-in automated toolpath functions within the Module One library package that is bundled with the platform. The ability to design-to-print workflow removes the complexity of machine programming. This intuitive approach allows students to focus on mastering core electronics concepts while gaining hands-on experience with advanced manufacturing technologies.
- In addition, Optomec offers a growing set of curriculum library modules that can be integrated across a wide range of coursework. These modular resources give educators the flexibility to adapt lessons to different learning levels and program objectives.
- By leveraging the full capabilities of Optomec's printers, institutions can progressively expand their educational offerings—supporting the development of new courses, research initiatives, and advanced training programs as their additive manufacturing capabilities evolve.
- Optomec has developed a high-quality, cost-effective platform designed specifically for engineering education community. It delivers the full performance and capabilities of Optomec's industrial systems while providing universities and training institutions with a scalable solution to expand research, electronics education, and advanced manufacturing learning for a broader group of students.

Hardware Product Specifications

PLATFORM SPECIFICATIONS	
SYSTEM DIMENSIONS	
Width	32.2" (818mm)
Depth	22.4" (570mm)
Height	54.62" (1387mm)
MOTION SUB-SYSTEM SPECS	
Axis'	2+1 manual
Actuator technology (XY)	Linear motor
X travel	200mm
Y travel	100mm
Z travel	50mm
Platen area (full tool access)	100mmx100mm
Accuracy	+/-5um

PLATFORM SPECIFICATIONS	
GENERAL FEATURES	
Machine Display	HMI
Heated platen	yes
Magnetic Alignment Capability	yes
Alignment Camera	yes
Process Camera	yes
System Exhaust	yes
DEPOSITION SPECS	
Atomizer tech	Ultrasonic
Feature size	10-250um
Shutter style	Mechanical
Cassette swap down time	1 minuite
Nozzle type	Disposable and Ceramic

SOFTWARE OVERVIEW

Optomec has developed a new software platform that will be introduced with the education system. Designed with a streamlined, intuitive HMI (Human–Machine Interface) console, the platform enables students and instructors to interact directly with the system, creating a more engaging and responsive lab experience.

Optomec's advanced software platform delivers intelligent system monitoring through automated alerts, diagnostic troubleshooting, and comprehensive log management. These capabilities provide greater visibility into system performance, enabling improved real–time process control and consistent output across many machines implemented in an education cluster.

Operational data from the printer can be securely stored locally or in the cloud, supporting flexible deployment and data management. This robust data logging framework also enables the integration of AI–driven analytics, allowing for predictive insights, optimize processes, and move toward smarter, more connected research initiatives focused on Industry 4.0 manufacturing.



CURRICULUM OVERVIEW

Lab Library Module Package of Curriculum Learning

This bundle includes Module 1 a series of 10 labs with outlined lab plans designed to teach students fundamentals of electronic circuits through additive manufacturing. These labs will also introduce basics of the aerosol jet printing process using inks consisting of conductive, resistive, and dielectric (insulating) materials. Labs are designed to fit into 2–3 hour timeslots, and course instructors will be given guides for expected data outcomes.

Lab 1. Printing Electrical Conductors

Introduces students to the additive fabrication of electronic devices using aerosol jet printing. Focuses on printing of electrically conductive lines using a metallic "ink", and how printing and processing conditions can affect their material/electrical properties.

Lab 2. Single Layer Capacitors

Displays fabrication of interdigitated capacitors, 2D devices commonly used in energy storage and sensing applications. Focuses on how print geometry affects electrical properties and how sensitivity changes in presence of water/humidity and other solvents.

Lab 3. Spiral Inductors

Displays fabrication of spiral inductors, 2D devices that store magnetic energy and are commonly used in radio-frequency (RF) circuits. Shows how print geometry affects electrical properties.

Lab 4. Printed Heaters

Displays fabrication of heater devices. Focuses on how electrical current run through a printed circuit generates power which can be directly correlated to temperature increase of the object it is printed on.

Lab 5. Parallel Plate Capacitors

Displays fabrication of multi-layer, parallel plate capacitors, devices used in energy storage and RC circuits. Focuses on how print geometry and dielectric material affect the electrical properties.

Lab 6. Antennas and Wireless Charging

Displays fabrication of antennas, devices used to convert radio waves into electrical signals and vice versa for information transmission. Shows how these structures can also be used for power transmission to enable wireless charging.

Lab 7. Strain Gauges

Displays fabrication and calibration of strain gauges, devices that are used to measure mechanical deformation of objects due to changes in electrical output under strain.

Lab 8. Resistors

Displays fabrication of resistors, components widely used for precise voltage control in devices. Introduces a carbon resistive material for printing. Focuses on how print geometry and circuit configuration affect electrical properties, including resistors in series and in parallel.

Lab 9. Additive Circuit Trimming

Showcases precision tuning of a circuit on a pre-prepared circuit board with components including batteries and LEDS. Displays how iterative additions of carbon resistive material can be used to activate the circuit and achieve optimal

Lab 10. Multilayer Crossover Circuits

Displays how multilayer devices can be fabricated without via connections by precisely printing electrical insulating material between conducting traces.

Optional Advanced Applications Curriculum

Optional advanced learning modules are avaible for gradute students through software upgrades. This includes upgraded Aerosol Jet hardware for faster shuttering, increased user controls, a wider range of feature sizes, and additional printable curriculum materials. Software upgrades will enable tool path editing and circuit development through CAD.

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About Optomec

Optomec is a leading supplier of digital manufacturing hardware and software. Optomec's patented Aerosol Jet systems for fine featuring printing and LENS ® and Optomec LENS brand 3D printers for metal component production and repair, are used by many industries to reduce production cost and improve performance. Together, these unique printing solutions work with the broadest spectrum of functional materials, ranging from electronic inks to structural metals and even biological matter. Optomec has delivered more than 700 of its proprietary digital manufacturing systems to more than 200 marquee customers around the world for production applications in the electronics, energy, life sciences, and aerospace industries. Notable customers include GE, Samsung, Ratheon, Siemens, Corning, Lockheed Martin, the US Air Force, US Navy, US Army, and NASA.