

Low Temperature Print Module

This module decreases the printing material temperature below room temperature, enabling the use of temperature-sensitive hydrogels that crosslink through thermal changes.

Specifications:

- Ideal for R&D on temperature-sensitive bioinks
- Print temperature control up to 4°C
- Temperature control accuracy: $\pm 0.2^{\circ}\text{C}$
- Compatible with 10cc disposable cartridges and syringe barrels
- Insulated body for uniform temperature distribution



High Temperature Print Module

The modular structure allows for interchangeable bioprinting heads. The high-temperature module supports printing of thermoplastics, ceramics, and composites for robust, multi-material lattice structures and drug delivery systems.

Specifications:

- Print temperature up to 220°C
- Ideal for thermoplastics like PCL, PLA, PLGA
- Suitable for composite bioinks containing HA, TCP, etc.
- Compatible with OmidAfarianan's steel cartridges for high temp/pressure printing
- Interchangeable nozzles for various geometries
- Insulated body for thermal stability



UV Crosslinking Module

Compatible with all OmidAfarianan printers, this module allows on-demand photopolymerization of UV-sensitive materials during and post-printing.

Specifications:

- Default wavelength: 365 nm
- Output power: up to 350 mW/cm²
- Beam angle: 30°
- Customizable wavelength (e.g., 385, 405, 455 nm)
- Customizable power and angle



FDM Print Module

This FDM module fits all printers by the company and enables extrusion of various thermoplastic filaments.

Specifications:

- Compatible with 1.75 mm or custom 3 mm filaments
- Flow rate up to 100 mm/s
- Interchangeable nozzles
- Ceramic-coated head for optimal heat distribution
- Max print temperature: 270°C



Syringe Pump Print Module

This module allows precise pressure control for low-viscosity bioinks, minimizing shear stress and enhancing cell viability.

Specifications:

- Compatible with 10cc standard syringes
- Ideal for low-viscosity materials like collagen, GelMA, and light crosslinkers
- Ambient print temperature
- Flow rate up to 10 mm/s



Camera Imaging Module

Allows real-time and post-print imaging without removing the structure from the print environment. Unlike many European or American systems, this module doesn't occupy a printhead slot.

Specifications:

- Manual dual-focus camera
- HD imaging
- Optional video recording
- Custom mount without interfering with other modules



Auto Calibration Module

Vital for precise multi-material bioprinting, this module automatically calibrates nozzles, printbed, and module alignment.

Specifications:

- Automatic nozzle-to-bed distance calibration
- Automatic printbed leveling
- Auto alignment for multi-material printheads
- Distance resolution: <0.01 mm
- Response time: <10 ms

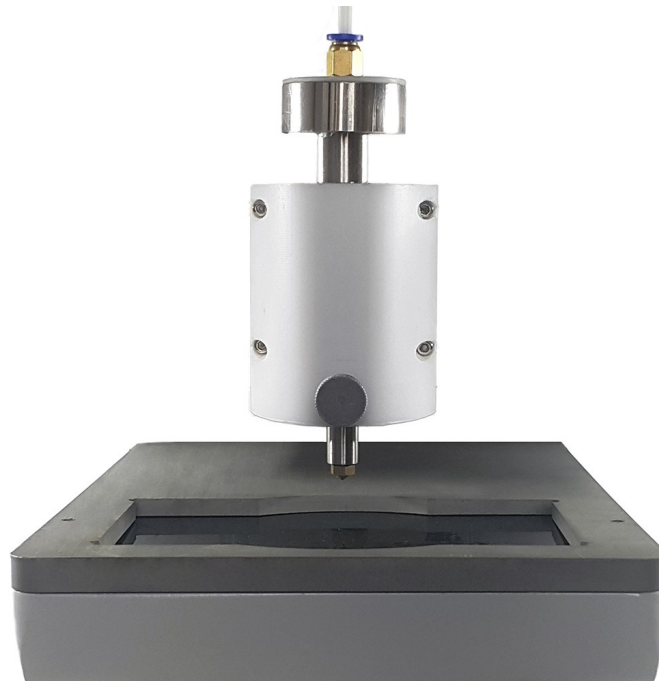


Melt Electrowriting (MEW) Module

This module enables generation of ultrafine nanofibers, integrating electrospinning with bioprinting in a single setup for advanced 3D tissue engineering.

Specifications:

- Voltage: up to 15 kV
- Nozzle diameters: 0.1 to 1 mm
- Pressure: up to 8 bar



Coaxial Bioprinting Module

Enables coaxial extrusion of 2 to 4 bioinks simultaneously for tubular or layered structures.

Specifications:

- Customizable nozzle diameters
- Independent flow rate control for each ink
- Compatible with pneumatic, syringe, low temp, high temp modules
- Ideal for tubular or multilayer constructs

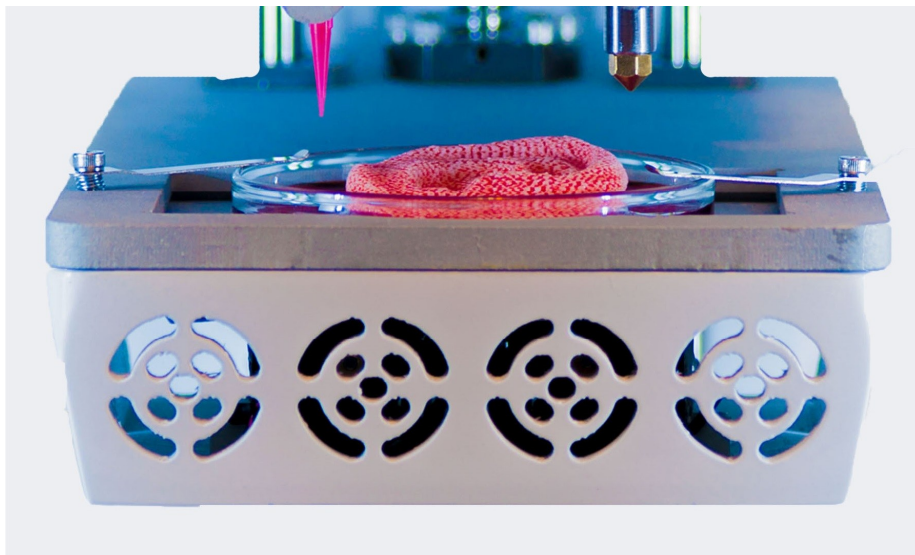


Low Temperature Bed Module

Allows temperature control of the printbed to below ambient temperature for sensitive bioinks.

Specifications:

- Temperature drop up to 4°C
- Ideal for thermally sensitive inks like GelMA
- Insulated body for thermal stability
- Metallic printbed for efficient heat conduction



Standard Pneumatic Print Module

A fundamental module for pneumatic-based bioprinting at ambient temperature, known for its simplicity and fast setup.

Specifications:

- Pneumatic (air pressure increases up to 8 bar) based bioprinting
- Lightweight aluminum body
- Compatible with OmidAfarianan 10cc steel, 10cc plastic, and disposable cartridges
- Suitable for most bioinks

