



## CeraPrinter

# F-Serie

### All-in-one State-of-the-art Digital Materials Deposition Platform

CeraPrinter F-Serie is All-in-one State-of-the-art Digital Materials Deposition Platform for process development in Printed Electronics and Smart 3D Printing. In addition to all the CeraPrinter advantages, F-Serie is a hybrid materials deposition platform combining Inkjet and Aerosol Jet® technologies. Its single user-friendly software opens the way to study hybrid process inaccessible by Inkjet or Aerosol Jet® separately. Defined as a modular-based scalable technology able to easily integrate several post-processes in-line at lowest cost, on minimum of footprint, with more capabilities, CeraPrinter F-Serie just enables you to succeed.

### Advantages

- > Designed for Advanced Digital Process Development in multidisciplinary fields
- > Modular-Based Scalable Technology for quick and easy upgrade
- > Latest key technologies in one tool enabling multi-team co-working
- > User-friendly single interface for all integrated technologies

### OUR OFFER

The whole CeraPrinter equipment range is high accuracy multi-material deposition systems with in-line multi-curing technologies, in-situ characterization facilities embedded simultaneously enabling high precision deposition of functional materials and full area curing in each pass.

Evolutionary at lowest cost and delivered with exclusive software suite developed by CERADROP (CeraSlice, DropAnalyser and FabAnalyser) allowing its quick start-up, easy to use and bottom-up approach for functional components design.

To go forward with our customers, we provide strong partnership, highly qualified, responsive worldwide maintenance and support team to provide assistance through each stage of project development.

### EXAMPLES OF PRINTED ELECTRONICS APPLICATIONS

- |                       |                                |
|-----------------------|--------------------------------|
| • HF Antenna          | • LTCC                         |
| • RFID                | • Multilayer Ceramic Capacitor |
| • OPV                 | • Magnetic components          |
| • OLED                | • Temperature sensors          |
| • Interconnection     | • Piezoelectric actuators      |
| • Printed memories    | • Sol gel selective deposition |
| • Photodetectors      | • Photocatalytic elements      |
| • Lens                | • Fuel cells                   |
| • Semiconductor       | • Solar cells front contacts   |
| • Biology             |                                |
| • Ceramic thick films |                                |

# F-Serie | Product Specifications

- Substrate up to 305 mm x 305 mm with thickness up to 10mm (larger on request)
- High accuracy five axis with motorized adjustable printing resolution, substrate alignment (+/- 2 µm) and nozzles self calibration (< +/- 3 µm)
- Up to five different printheads (more on request) to deposit wide range of functional inks and high viscous pastes
- Able to print in Raster-Scan Mode (X or Y), Vector Mode (XY) and Single Pass (X or Y)

## HARDWARE

### MOTION SYSTEM: HIGH ACCURACY CALIBRATED FIVE AXIS DEVICE

*Three translation axis and two motorized rotations (printheads resolution calibration + substrate alignment)*

X and Y stage accuracy	< +/- 1.5 µm
Z accuracy	< +/- 2 µm
X and Y stage repeatability	< +/- 0.5 µm
Z repeatability	< +/- 1 µm
Print velocity	up to 500 mm/s

### PRINTHEADS HOLDER: MOTORIZED AND PLUG & PLAY

*Embeds easily a wide range of printheads with motorized resolution fine tuning and nozzles position self calibration*

Print resolution	< 5 µm x 5 µm
Printheads number	Up to 4 Inkjet heads and 1 Aerosol Jet® head
Printhead types	Single nozzle Low cost Dimatix Cartridges Drive per nozzle printheads Dimatix, Konica-Minolta and other on request (Xaar, Kyocera, Ricoh, Toshiba, Seiko...etc.)
Aerosol Jet® Technology	Pneumatic atomizer and Fine feature printhead Nozzle size 100 µm to 300 µm Ink viscosity 1-1000 cP
Mounting	"Smart door" technology Accurate fast mount for printheads and its electronics
Ink tank	Cartridge 2 mL to 50 mL Aggressive solvents compatible
Printhead heating	Up to 60°C
Printhead Maintenance	Automated cleaning station

### SUBSTRATE HOLDER: MOTORIZED VACUUM HEATED CHUCK

*Designed to manage a wide range of substrates for many applications*

Size	305 mm x 305 mm
Clamping	Vacuum with different areas
Heating	Up to 60°C

### MECHANICAL

Machine footprint	1520 mm x 1870 mm x 1970 mm
Machine mean weight	1800 kg
Power	400 V/32A, 3 phases
Certification / Safety	CE (UL & CSA on request)

### CAMERA: THREE DEVICES WITH DIFFERENT LIGHT SOURCES

*Three cameras with different light sources to check jetting, to align substrate, to analyze all parts of printed components and in-situ Aerosol Jet® follow*

Droplet analysis	
CCD	1624 x 1228 pixels
Visualization area	1.79 x 1.35 mm
Image analysis	Fully automated (DropAnalyser)
Alignment and printed components analysis	
CCD	1624 x 1228 pixels
Visualization area	1.79 x 1.35 mm
Alignment types	Marks, edge or specific if required
Image analysis	Fully automated (FabAnalyser)
In-situ Aerosol Jet® process analysis	
CMOS color camera	2592 x 1944 pixels
Visualization area	1.900 x 1.425 mm

### UP TO 3 POST-TREATMENT: TO DRY AND TO CURE PRINTED LAYERS

*Fully integrated and synchronized with the printing for all kind of drying/curing devices*

Post-process compatibility	IR, UV, AdphosNIR®, Novacentrix PulseForge®, Xenon Sinteron, Vacuum Drying
Substrate management	Directly by the manufacturing linear axis to avoid substrate manipulation
Solvent extraction	Exhaust connection

### OPTIONS

IR Drying	Printhead slot
UV	Laser reflectometer
AdphosNIR®, Novacentrix PulseForge®, Xenon Sinteron, Vacuum Drying	HEPA filter
Other post-treatment	Dedicated software add-on
Specific hardware modification	Automated Handling (on request)
Automated sheet resistance measurement probe	

## SOFTWARE

### CERASLICE: EXCLUSIVE CAD/CAM SOFTWARE

*Bottom-up approach to import, to edit, to simulate and to sequence the printing of a wide range of printed electronics and smart 3D printing designs*

File formats	DXF, STEP, Gerber, GDSII, BMP (as an option via conversion tool)
Job editing	Directly from standard CAD file via CAD/CAM tool
Printing job parameters	Fully tunable for each part or under part of the components
Manufacturing sequence definition	Easy and fast, for each step of the printing process (printing vector, nozzle clogging control, alignment, printhead cleaning etc.)
Advanced simulator stage	Step by step, materials by materials
Experiment plans	Automated experiment plans generation to optimize inkjet process (fully customizable)
Customizable pre-loaded patterns	Square transistors, circular transistors, multilayer capacitors, induction, coil, etc.
Hybrid Manufacturing	Scenario and pattern filling simulation; Fully tunable printing strategy; User parameters library generation

### DROPANALYSER: AUTOMATED DROP JETTING ANALYSIS SOFTWARE

Waveform tuning	Real time, fully open, drive per nozzle
Automation	Automatic printheads mapping
Analysis	Volume, velocity, jet straightness error Clogged nozzles detection Self nozzles positions calibration Drop to drop variation
Reporting	Detailed statistics report on whole nozzle plate

### FABANALYSER: POST-PRINTING CHARACTERIZATION SOFTWARE

Layers analysis	Automated measurements (distance, area) Automated full printing area acquisition 3D reconstruction via laser reflectometer option
Substrate alignment	Manual or automatic Can be fully adapted to customer application