System Specification

Document 01 | Rev C | 17 November 2026 | Status: design package. Nothing has been built or bench-tested; numbers are design targets, calculations or simulations.

Blaide is a desktop machine that makes prototype circuit boards four ways with one tool-changing head: printed silver circuits of up to four layers, milled copper, laser-exposed copper, and a hybrid of these, followed by solder paste dispensing and reflow on its heated bed.

1. Performance targets

Parameter	Target	Basis
Board area	150 x 110 mm	CAD travel
Envelope	400 x 460 x 330 mm	CAD
Mass	16 kg	CAD model volumes
Travel X / Y / Z	194 / 188 / 45 mm	CAD; firmware limits match
Resolution	1.25 um per microstep (800 steps/mm)	firmware config
Max speed XY / Z	100 / 20 mm/s	firmware config
Acceleration XY	1500 mm/s2, jerk limited to 375,000 mm/s3	simulation D
Positioning accuracy XY	0.072 mm combined (target 0.1 mm)	accuracy budget
Tools	2 dispensers, spindle, 405 nm laser; automatic change	CAD
Minimum trace / gap	0.20 / 0.20 mm printed and milled; 0.10 / 0.10 mm laser-exposed	CAM limits
Printed layers	up to 4, with printed dielectric	CAM
Bed	200 W, firmware limit 245 C, thermal fuse 260 C	firmware config
Bed warm-up to 180 C	428 s (model)	simulation C
Supply	24 V, 250 W	BOM
Connectivity	Wi-Fi; app runs in the browser; USB for service	design
On-machine interface	one light line (16 LEDs), one button	FP-100
Noise, EMC, safety approval	not assessed	open item

2. Recipes

Recipe	Process	Tools used
A	Printed silver, multilayer with dielectric	Dispenser A (silver), dispenser B (dielectric), bed cure, UV bar
B	Milled copper, drilled	Spindle
C	UV-exposed photoresist on copper, user develops and etches	Laser
D	Hybrid: milled or exposed copper plus printed features	All

3. Environment and supply

- Indoor bench use, 15 to 30 C. Bed cool-down relies on natural convection.
- Mains through an external-style 24 V 250 W supply housed in the base; inlet with switch and fuse.
- Exhaust through a replaceable filter cartridge at the rear.

4. What this specification does not cover

- Ink performance: no ink has been selected or tested.

- Regulatory approval: laser class, machinery and EMC assessments are not done (see document 13).
- The carriage board CB-100 exists as a schematic-level part list and net list only.