# Probe tool: Theory of Operation

PRB-1 | Blaide product line | 17 November 2026 | Design only: nothing built or tested

The metal bed under the board acts as one plate of a capacitor and each copper net as the other. Capacitance is proportional to the net's copper area, which the design gives exactly. Touching both ends of a net and reading the same value shows it is whole; a lower value at one end shows a break; a value larger than the design area shows it is joined to a neighbour. A shield driven at the probe's own potential surrounds the probe so its wiring does not add to the reading.

## Design

- Spring probe inside a driven shield, 0.6 mm tip at the standard tool position
- PT-100 board: capacitance converter, 3.3 V regulator from switched 24 V, identity resistor
- Each net's capacitance to the bed is compared with its copper area; two ends of a net must agree
- Reference coupon with six pads from 0.2 to 3.6 pF for a self-check