PLC Analog Input Fault Finding Guide

Vendor neutral fault finding guide for field technicians

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Before you start

- Permit, isolation and control room informed.
- Put the loop in manual or inhibit trips as authorised.
- Use certified test equipment in hazardous areas.
- Record as found readings before changing anything.

Quick checks

- Measure loop current at the card.
- Compare raw counts with expected.
- Check card diagnostics and forces.
- Check shield grounding.

Symptoms, causes and fixes

Symptom	Likely causes	Checks and fixes
Value wrong but mA correct	Scaling, raw range or units wrong	Check raw limits (e.g. 0 to 27648) and LRV, URV
Overrange or underrange alarm	Signal outside card limits, open wire	Measure mA; check wiring
Two channels interfere	Mixed 2 and 4 wire devices on shared common, ground loop	Wire per card manual; isolate
Noisy value	Shield earthed both ends, VFD cables nearby, no filter	Single point shield; segregate; filter
Stuck value	Channel or module fault, forced value	Check module status and forces
HART not passing	Card not HART capable, low loop resistance	Check card type; add resistance

Formulas

- Value = LRV + (raw − raw_{min}) ÷ (raw_{max} − raw_{min}) × span.
- mA = 4 + 16 × %.
- Size loops for 22 mA.