Modbus and HART Communication 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

- Settings match on both sides?
- Termination and bias correct?
- Exception code returned?
- Use a frame decoder to check bytes.

Symptoms, causes and fixes

Symptom	Likely causes	Checks and fixes
No response	Wrong address, baud, parity; A/B swapped; device off	Check settings and polarity; one device at a time
CRC errors	Noise, missing termination, stubs, wrong baud	Terminate both ends; daisy chain; check baud
Wrong values	Register offset of one, word order, scaling	Try address −1; swap words; check scaling
Intermittent timeouts	Poll too fast, long cable, weak bias	Increase timeout; check biasing
Modbus TCP no connect	IP, subnet, port 502 blocked, unit ID	Ping; check firewall; unit ID
HART no communication	Loop resistance below 250 Ω, wrong points, address	Add resistance; connect across load; poll address

Exception codes

Code	Meaning
01	Illegal function
02	Illegal data address
03	Illegal data value
04	Server device failure