



RS485 / MODBUS RTU FIELD CHEAT SHEET



Distance vs. Baud Rate (Rule of Thumb)

Baud Rate	Max Distance (24 AWG)
9.6 kbps	1,200 m (4,000 ft)
19.2 kbps	1,200 m (4,000 ft)
115.2 kbps	1,000 m (3,280 ft)
1.0 Mbps	120 m (400 ft)
10.0 Mbps	12 m (40 ft)

* Assumes twisted pair cable. Add 120Ω termination at both ends for runs > 100m.



Top 3 "Ghost Timeout" Causes

- **A/B Polarity Flipped:** No standard exists. Vendor A's "A" might be Vendor B's "B". When in doubt, swap them.
- **Missing Signal Ground:** 2-wire setups can fail due to common-mode voltage differences. Use an isolator.
- **Endianness Mismatch:** Modbus CRC-16 is sent **Little-Endian** (Low Byte first, High Byte second).



Modbus RTU Frame Structure

Silence ≥ 3.5 chars	Slave ID 1 Byte	Func Code 1 Byte	Data 0 to 252 Bytes	CRC-16 2 Bytes	Silence ≥ 3.5 chars
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