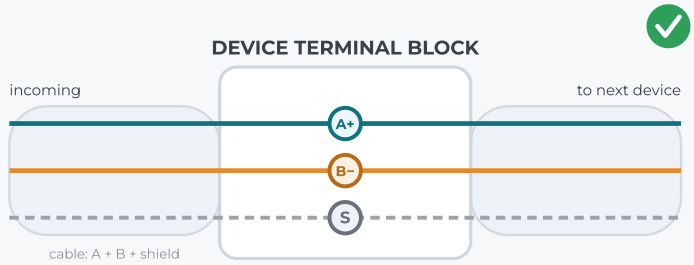
RS-485 data bus wiring

Instructions for the installation company · MANDÍK and ZEUS control

Wiring rules

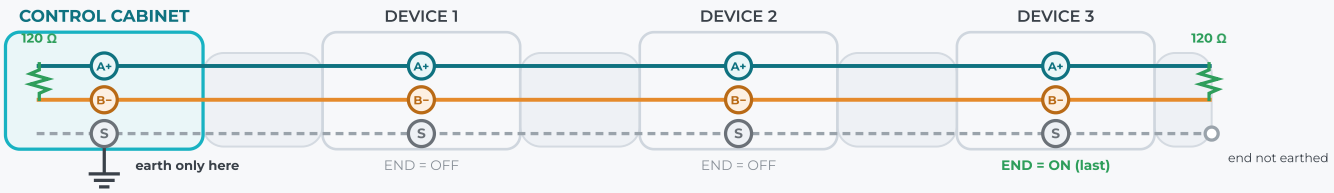
- **Cable:** shielded twisted pair, the A/B data pair in one twist. Recommended **J-Y(St)Y 2×2×0.8** (or 3×2×0.8), or shielded CAT 5E. Leave the spare pair free.
- **Topology:** daisy-chain – the cable runs from device to device. **Not a star**; stub max. 1 m.
- **Termination: 120 Ω resistor only at the two ends** of the bus. At the last device via the switch **END = ON**, intermediate devices **END = OFF**.
- **Polarity:** keep **A↔A, B↔B** on all devices. **A = A+, B = B−** – labelling may differ between devices, follow the polarity.
- **Parameters:** the same baud rate and parity on all devices (default 19200 bps, 8/Even/1).
- **Shield:** connect it through all devices, but **earth it at one point only** – at the control cabinet. **Do not earth** the other end (leave it insulated).
- **Routing:** run the data bus **separately from power cables**.

Terminal detail – loop-through and shield



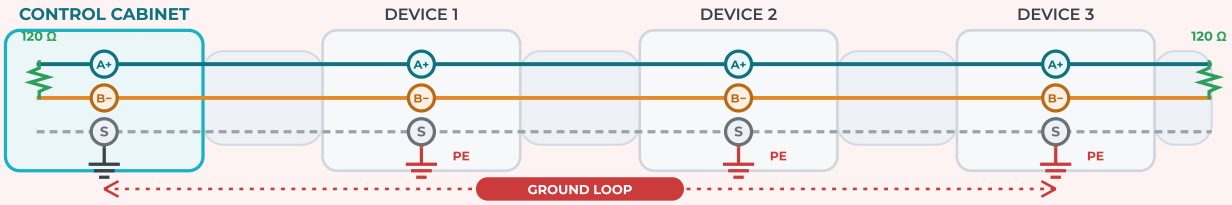
The shield must be **connected through** at every device; if the device has no terminal for it, use e.g. a **WAGO** connector. Inside the device the shield **must not be connected to any other potential**.

Whole bus – shield on its own terminal, earthed at one point ✓ CORRECT



Terminals **A, B and shield (S)** are inside the device; **the bus is always connected on the matching terminal** (daisy-chain). The shield runs through its own terminal and is earthed only at the control cabinet; the other end is not earthed. 120 Ω termination at both ends.

Common mistake – shield terminal connected to PE in every device ✗ WRONG



A jumper from the shield terminal to PE inside every device earths the shield at several points and creates a ground loop – interference, communication dropouts, the loading spinner in the visualisation. The shield may be earthed **at one point only** (see the diagram above).

Other common bus mistakes

- **Termination resistor (120 Ω) in several places** – END = ON also in the middle of the line; it belongs only at both ends.
- **Two devices with the same address**, or an address outside the set range.
- **Different baud rate or parity** between devices – it must be the same on all of them.
- **Swapped A and B wires** (reversed polarity): **A = A+, B = B−**.