

Topic: Connection of RS485 interfaces

This information describes the prevention/ elimination of possible interference sources when connecting serial interfaces in RS485 duplex or half duplex operation.

Problem, reason

Disturbances on the communication lines can be caused by different reasons. This can be:

- Induced interferences on the data lines.
- Disturbances on the ground potential.
- Potential differences between the ground potentials (for not isolated interfaces).

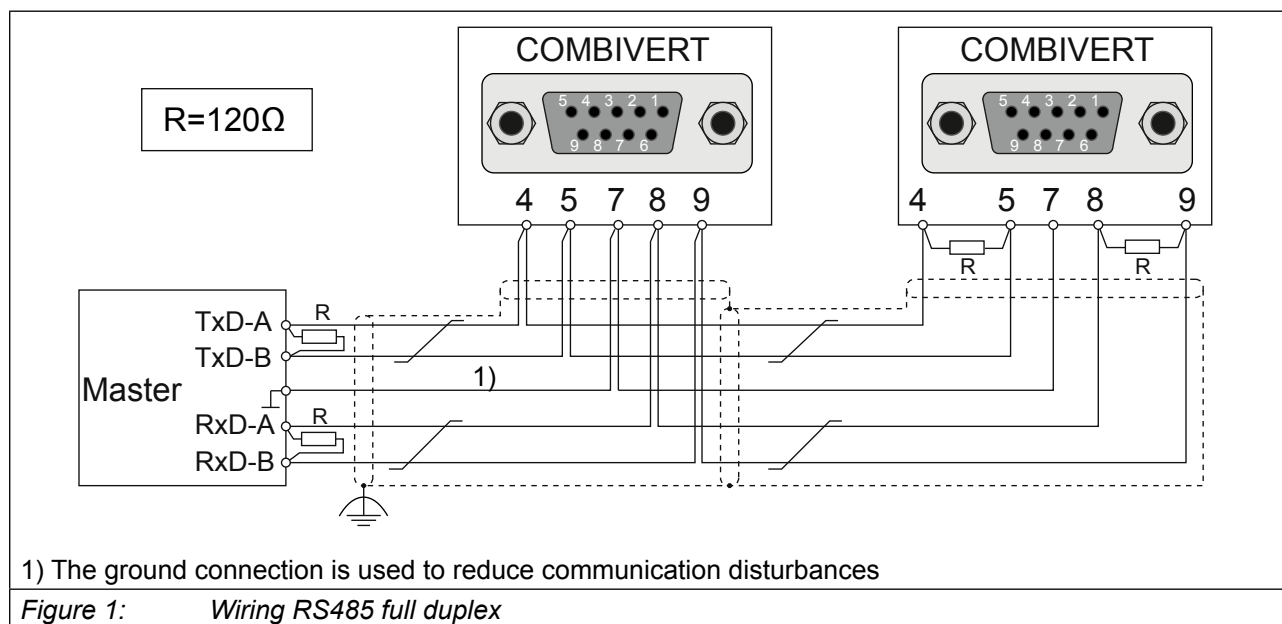
Preventive measures against induced interferences on the data lines

- ▶ Use in pairs, twisted and shielded cable.
- ▶ Ground outer shield at one side (prior at interference-free side).
- ▶ Connect terminating resistors (120Ω) at both ends on pair of wires of the communication bus.
- ▶ If available, the internal shielding must be laid at the transmitter to ground.

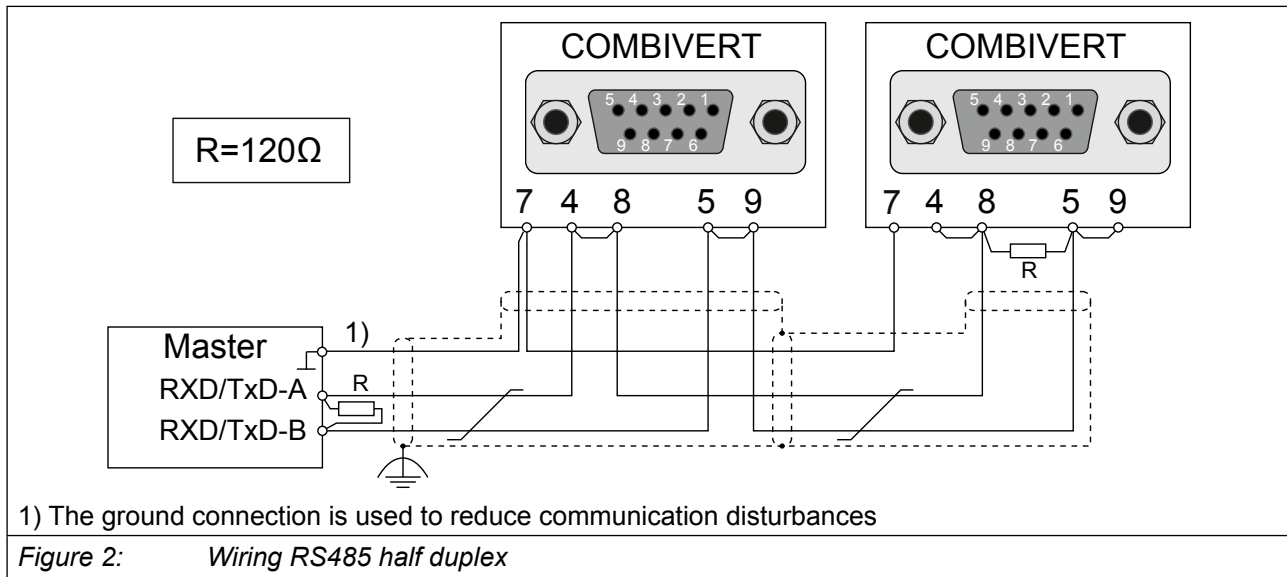
Preventive measures against induced interferences via the ground potential

- ▶ Connect earth cable between the bus nodes.
- ▶ Observe potential differences between the unit grounds (see next page).

Wiring RS485 full duplex



Wiring RS485 half duplex



Potential differences in the ground potential

- Observe potential differences between the unit grounds and max. common mode voltage, in order that the interfaces are not destroyed.
- Lay additional ground cable between the terminals outside of the bus line.



A biasing can be used if there are still interferences. However, this should be done only once at the communication bus (preferably at the master).