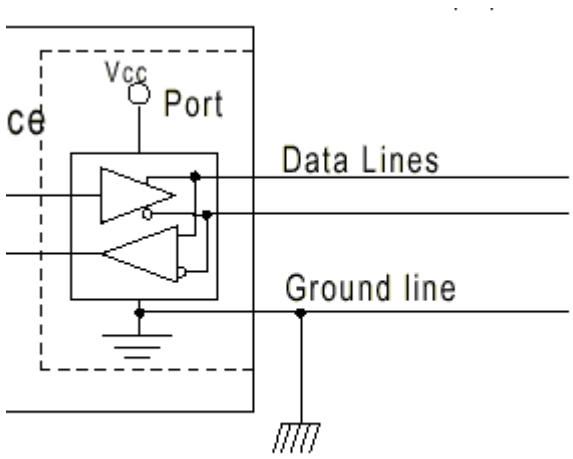
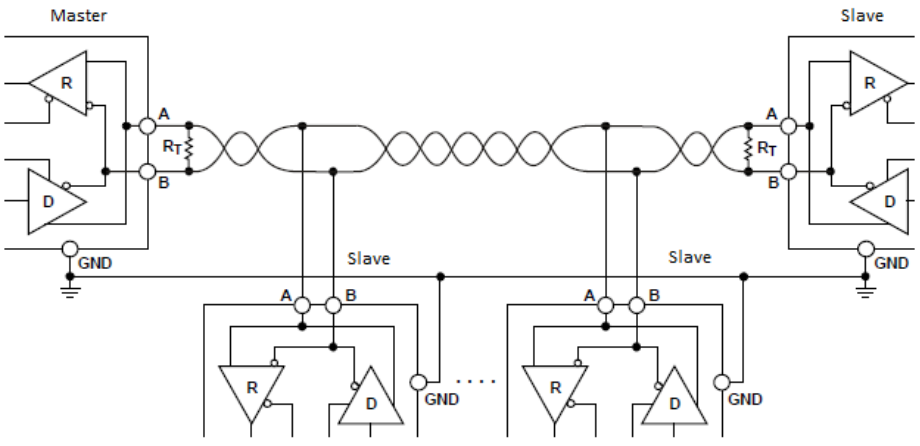
RS-485 Application Note A

1. **Grounding:** Without proper grounding, large voltage and currents may run across communication lines causing damage. Also, in order for on board RS-485 protection circuitry to work, the ground signal between DMX-K-SA-23 and RS-485 must be connected. User should connect communication signal ground, power ground and earth ground all together. See below.



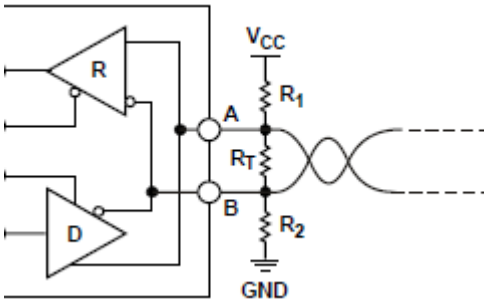
Local Chassis Ground Connection

2. **Termination:** Without proper termination, reflections on the RS-485 bus can cause communication noise.
   a. Our RS-485 is 2-wire, which requires the termination of both at the beginning and end of the communication bus. See the figure below. The termination resistor value (Rt) should be 120 Ω.



Note: If the communication bus is very short, then the termination resistor may drown out the signal entirely. In this case, a termination resistor should not be used.

3. **Fail-Safe Biasing:** Without proper fail-safe biasing, noise on the RS-485 will increase RS-485 communication.
    a. See below for proper RS-485 fail-safe biasing. Fail safe resistors must only be placed at **one** node of the network. R1 and R2 fail safe resistors should be 1440 Ω for VCC=5 V and 960 Ω for VCC=3 V



4. **Cable Selection:** When wiring RS-485 lines, it is important to use twisted pairs on the 485+/485- lines to increase noise immunity. See below.