

# APPLICATION NOTE

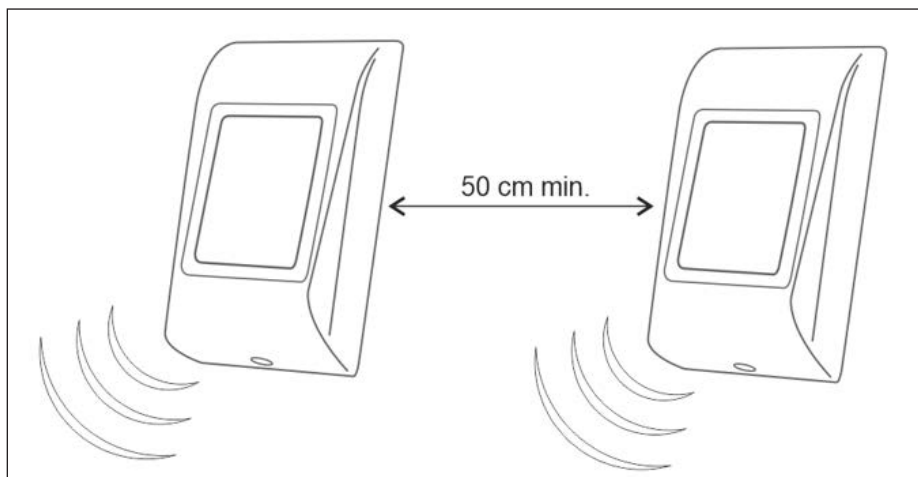
ONLine Access

Cabling instructions

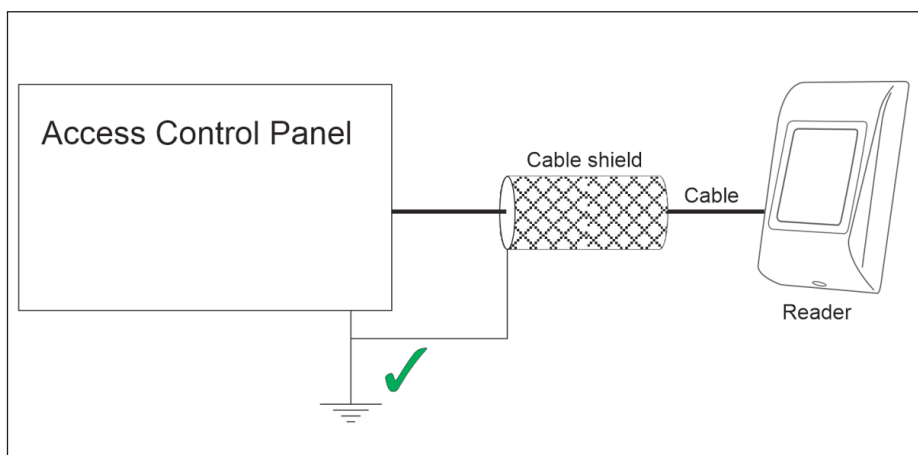
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## **Wiring Readers**

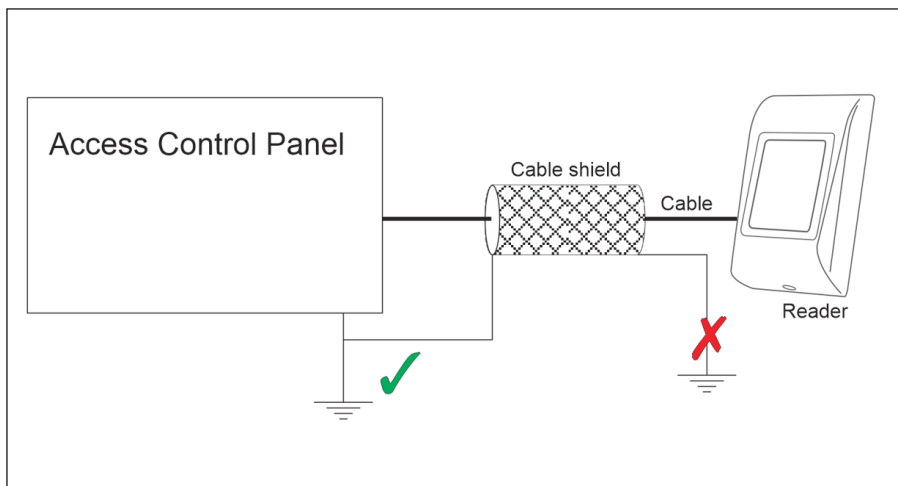
- When installed on the same surface, maintain a minimum of 50 centimeters distance between two readers, or at least 15 cm if they are mounted back to back.



- Provide metal shielding if needed, when connected back to back.
- Do not install MIFARE proximity reader on metal surfaces. If there is an installation where the metal surface cannot be avoided, isolation base between the reader and the metal must be used. The thickness of the isolation base should be determined with test.
- For the proximity readers and the keypads use 6-conductor shielded cable 0.26 to 0.5 mm<sup>2</sup> (18-23 AWG)
- Make sure that cables carrying data (e.g. from the reader) are shielded and the shield is connected to the ground at one end, not at both ends.
- Avoid running the data cables alongside high power cables. If it is necessary, then use the shield.



Picture 2. Correct shielding - Shielded cable grounded at one end.



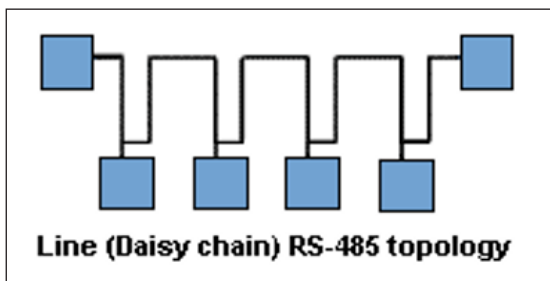
Picture 3. Incorrect shielding - Shielded cable grounded at both ends.

### **Wiring for non-reader components**

Cables differ both in the number and the thickness of their wires (also known as “cores”). For distances under 25m, a wire thickness of 23 – 20 AWG or 0.26 to 0.5 mm<sup>2</sup> will be sufficient. For longer distances and stronger currents correspondingly thicker wires will be required.

### **Wiring RS-485**

- Use 3 wire cable for RS-485, where one wire is the ground and the other two wires are in twisted pair.
- Always use twisted pair cable and if possible shielded cable.
- If shielded cable is used, connect the shield to earth at one end.
- 24AWG twisted pair cable with a shunt capacitance of 16 pF per foot and 100 ohm characteristic impedance.
- **CAT5/CAT6**, STP or UTP cable can be used for RS-485 line. Another example would be **Belden 3105A** cable
- Always keep the RS-485 line in daisy chain, not in a star.



- Do not run the RS-485 line near: generators, motors, high power cables, neon lights.
- Under 100 m of length, normally, end of line resistors are not needed. For lengths above 100 m EOL resistors are needed. Use the Jumpers in the controller to put the EOL resistors.