

Simulator EMC cable recommendations

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Context

This document presents recommendations for good cabling design to ensure electromagnetic compliance (EMC) of the simulator. Failing to follow the recommendations might lead to energy transfer in electromagnetic interference (EMI) that can disturb the equipment in the neighbor environment.

Cable component items

- Ferrite clamp of proper circumference
- Twisted pair wires for signal and power
- Shield

Analog Cable assembly

The D-sub37 cable used for the analog IO must follow the recommendations:

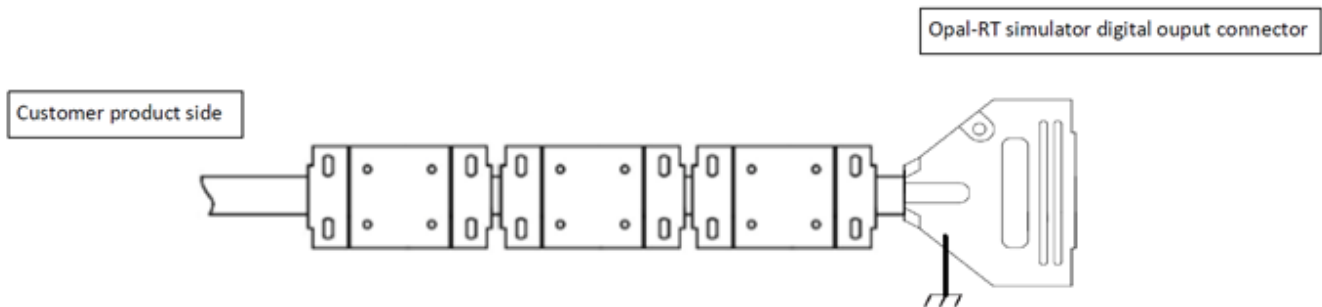
- Data should be cabled in twisted pairs.
- Cables should have a shield around the data.
- One shield per type of IO and direction.
- The shield should be connected to the connectors' shell/casing at both ends.
- The shells/casings should be connected to the chassis earth ground on both equipment.
- The total cable length should be less than 3 m (9 feet).

Digital Cable Assembly

The D-sub37 cable used for the digital IO must follow the recommendations:

- Data should be cabled in twisted pairs.
- Cables should have a shield around the data.
- One shield per type of IO and direction.
- The shield should be connected to the connectors' shell/casing at both ends.
- The shells/casings should be connected to the chassis earth ground on both equipment.
- The total cable length should be less than 3 m (9 feet).
- For Digital Output cables, the VUser_RTN signal should be connected to the shell/casing of the cable with a 100nF capacitor on both ends.
- The cable should have a ferrite clamp on the Digital Output side.
 - During EMC certification, Opal-RT used 3 clamps (Laird-Signal Integrity Products #28A2913-0A2) mount like in figure 1.

Figure 1: Simulator DB37 digital output connector side.



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The power cable used for the VUser in Digital Output cards must follow the recommendations:

1. Power connections should use twisted pairs.
2. Cable should have a shield around the twisted pairs.
3. One shield per type of IO and direction.
4. The shells/casings should be connected to the chassis earth ground on both equipment.

5. The total cable length should be less than 3 m (9 feet).
6. The cable should have a ferrite clamp on the Digital Output side.
 - During EMC certification, Opal-RT used the clamp (Laird-Signal Integrity Products #28A2736-0A2) mount with multiple turns like in figure 2.

Figure 2: Power cable for VUser

