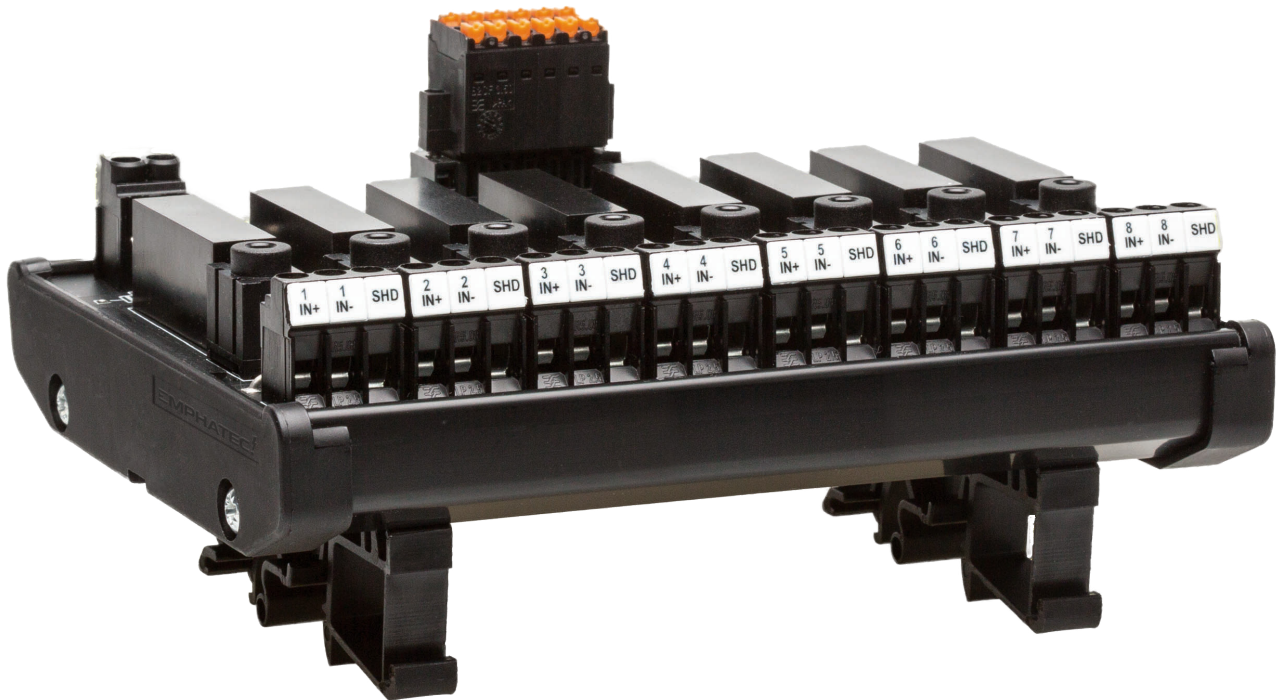


Emphatec InstaLink® - CLIX/8 : Grounding of Shielded Cables

Application Note



The Emphatec InstaLink® - CLix/8 has provisions for grounding the shield on incoming cables from field transmitters as well as the cable to the PLC analog input card. In theory, shields should not be grounded at multiple points as this can create ground loops and actually introduce noise into a control system.

The figure 1 below shows a field transmitter interfaced to a PLC via the CLix/8 loop isolator. There are 4 potential shield grounding points (points 1, 2, 3, 4 in Figure 1) assuming the CLix/8 is connected to earth ground at point 5.

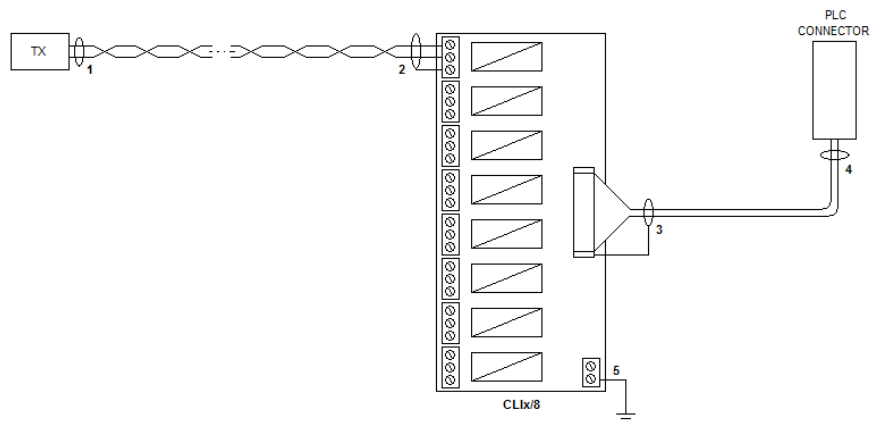


Figure 1: The earth ground terminals (5) connect to the input “SHD” terminals and pins 1 & 12 of the PLC cable connector

With regards to the field transmitter cabling, if the shield is grounded at the transmitter it should not be connected to the CLix/8 input terminals at point 2. Making this connection has the potential to cause a ground loop. The longer the length of the cabling the more likely a ground loop will be created. As 4-20mA signals are suitable for long distances this scenario is quite likely. See figure 2.

If the shield is not grounded at the transmitter then it should be connected to the input terminals at point 2 and grounded via the terminals at point 5. Point 5 should be connected directly to ground, not “daisy chained” to other devices and then to ground. Two grounds terminals are provided because a single PCB mounted terminal is not practical.

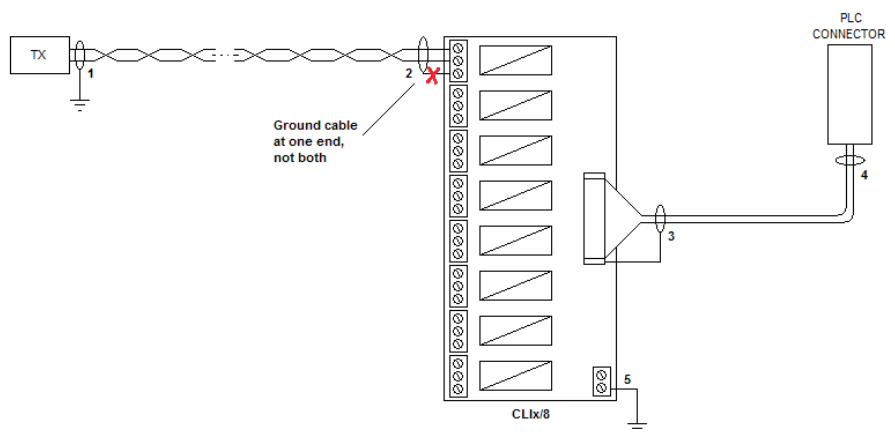


Figure 2: Do not ground cables from transmitters at both ends

The shield on the cable between the CLlx/8 and the PLC analog input card should be grounded via the CLlx/8 and not grounded at the PLC connector. This is a matter of convenience as many PLC cards do not include provision for shield grounding. Having said that, it is likely that the CLlx/8 is installed in close proximity to the PLC (within the same control cabinet for example) so a ground loop between the CLlx/8 and the PLC is very unlikely. Because of this grounding the cable at both ends should not cause a problem.

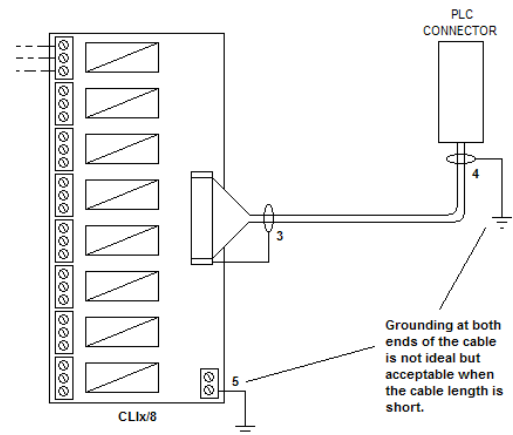


Figure 3: Grounding cables at multiples points within a control cabinet is not ideal but should not cause a ground loop

Weidmuller Ltd.

10 Spy Court
 Markham, ON
 Canada
 L3R 5H6
 Toll Free: (800)268-4080

www.klippon-engineering.com/emphatec

Subject to technical changes

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