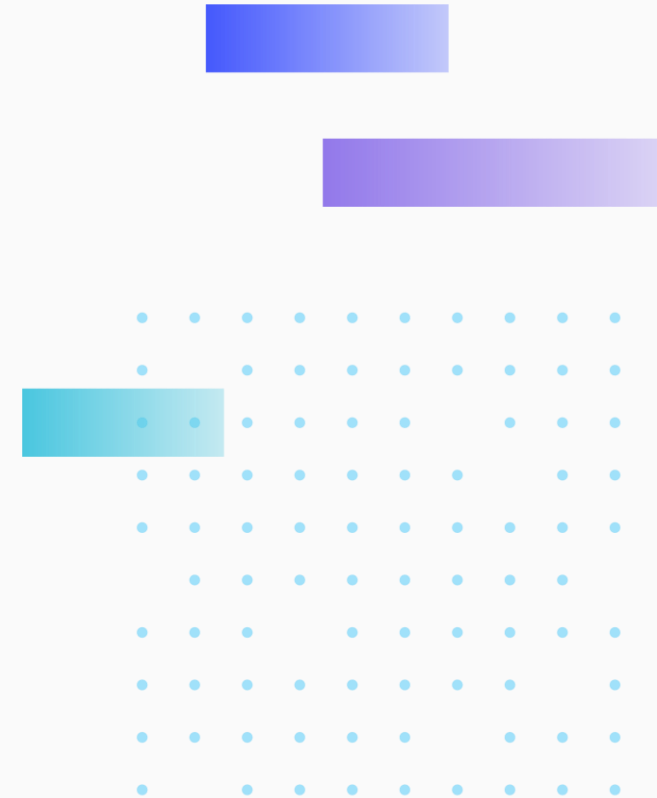


# Surge Protection

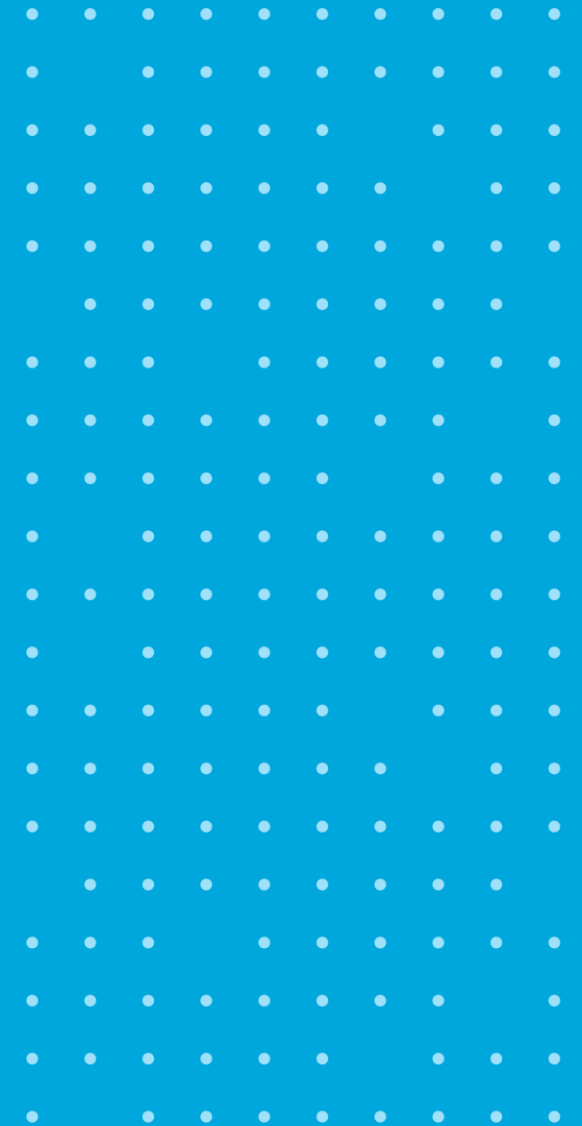
Quick Installation Guide  
(General Cameras)

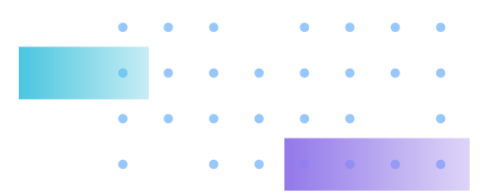
Aug 10, 2021

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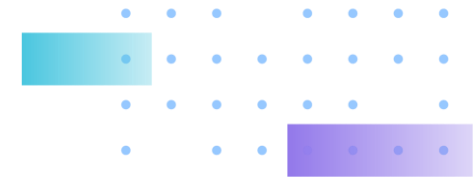
# Installation Guide



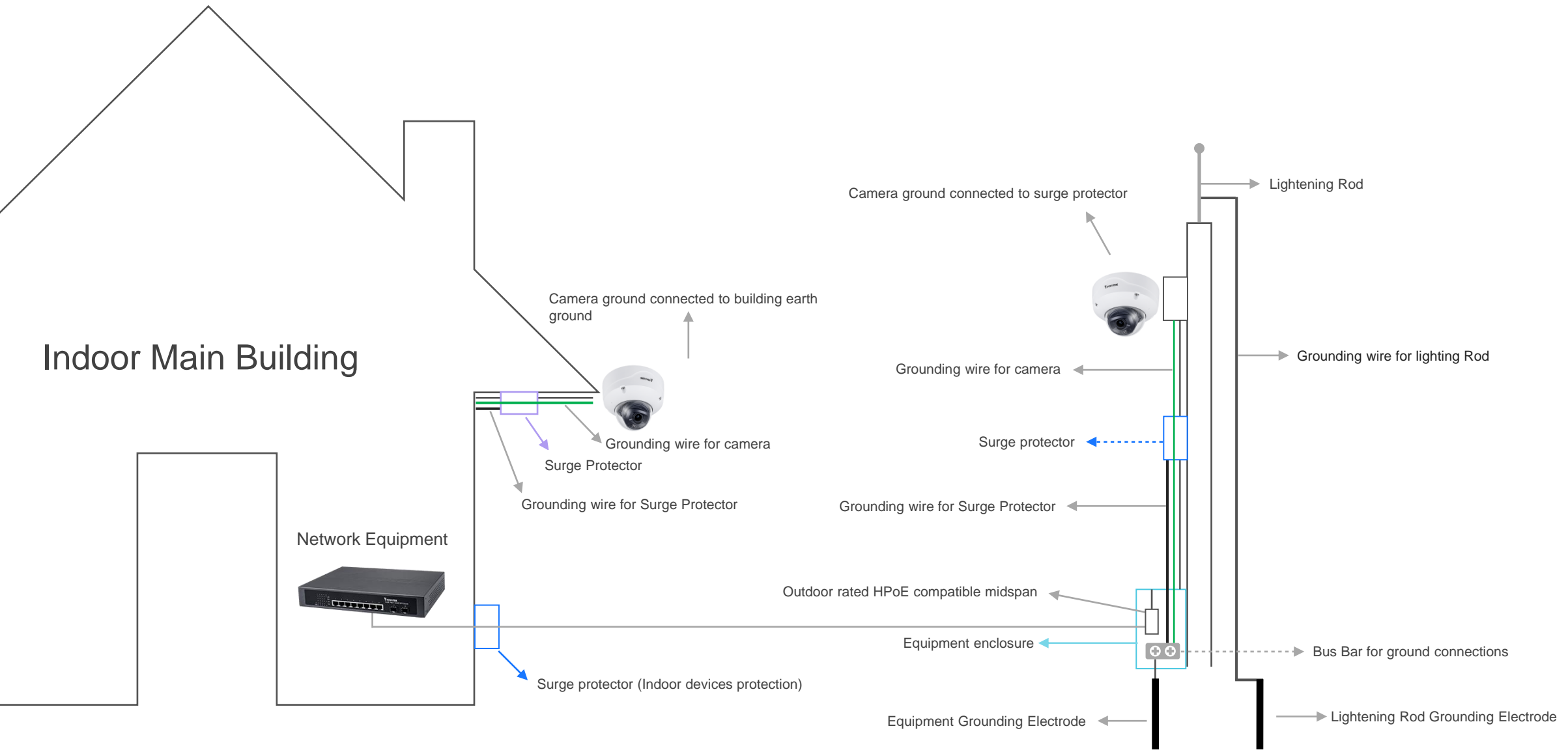


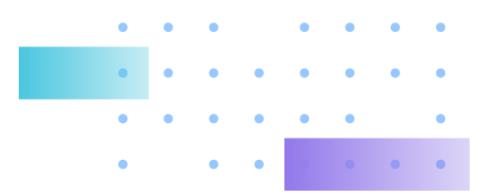
## Surge protector installation guide

- ▶ Right picture it the recommended topology of surge protector solutions, it contains lightning rod, surge protector, bus bar and grounding rod.
- ▶ For the correct installation of lightning rod and surge protector, please contact the manufacture.



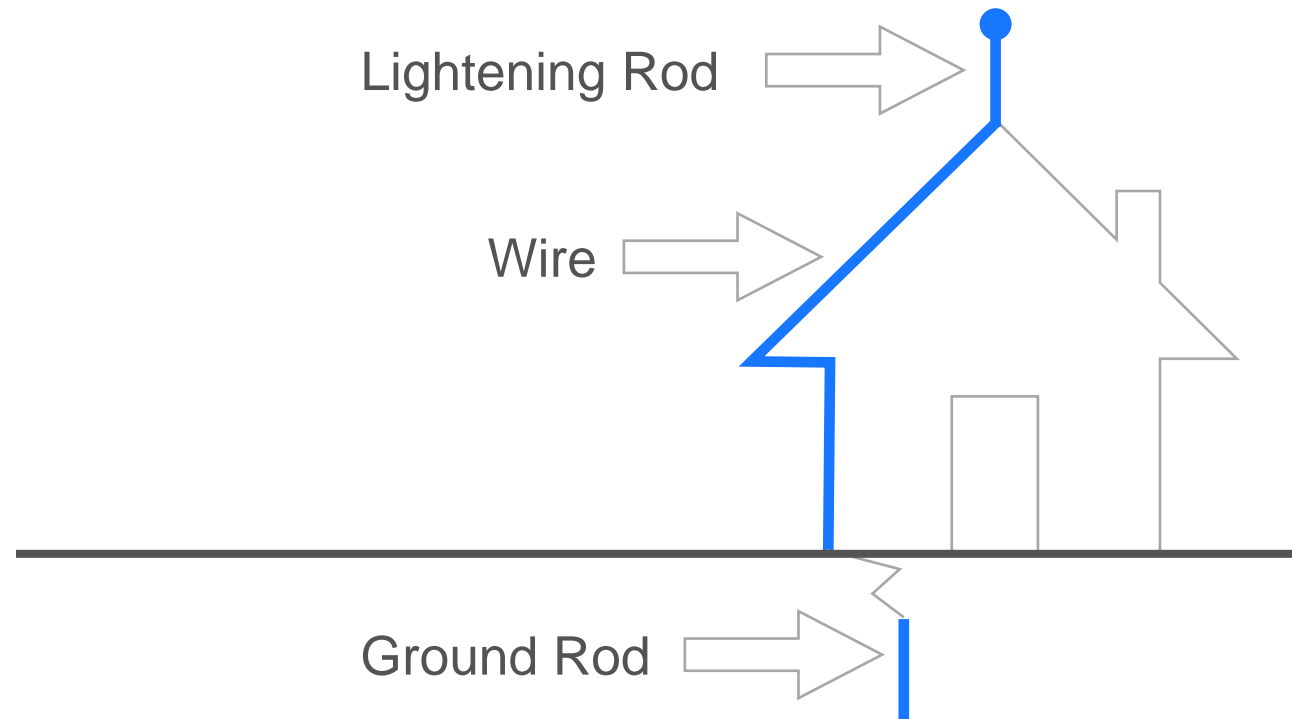
# Surge protector installation guide (Cont.)





## Lightning rod

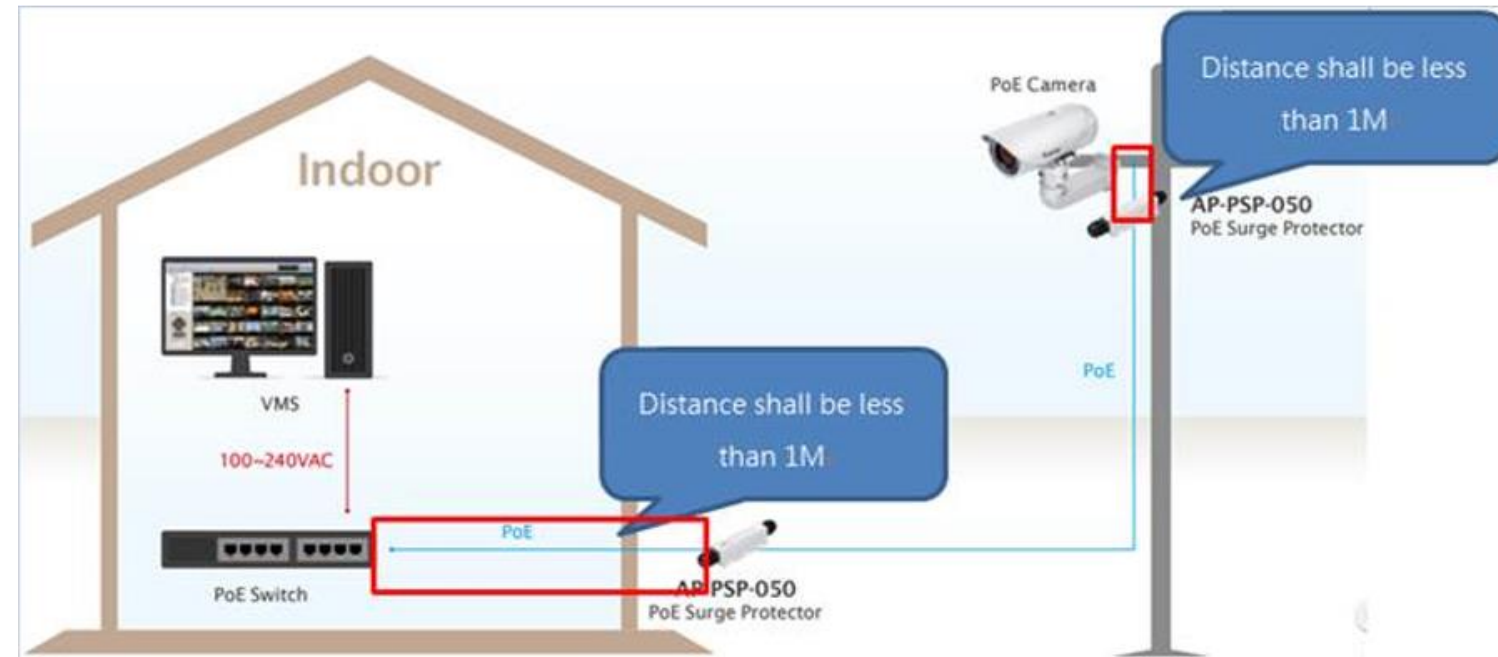
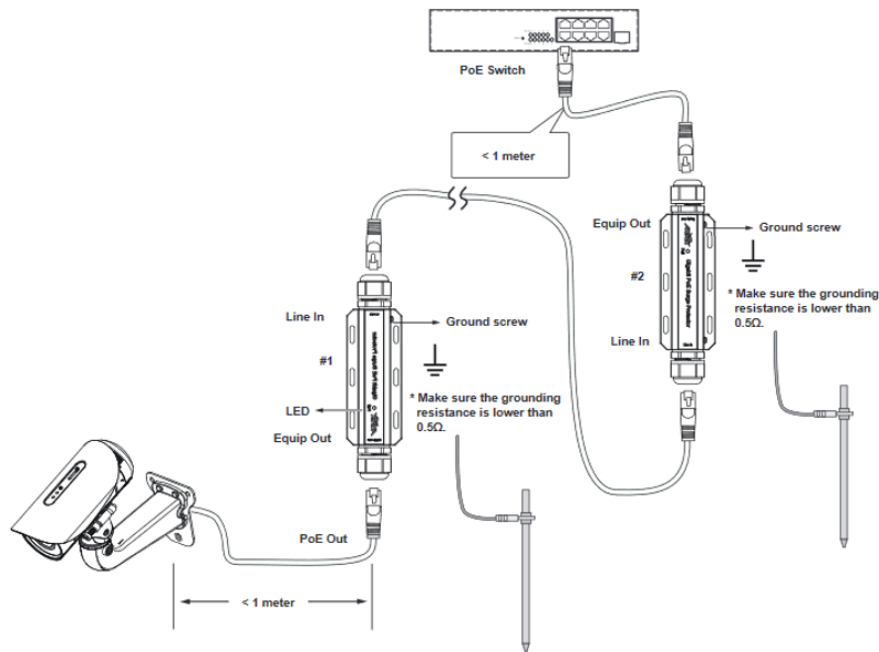
- ▶ Lightning rod should be installed in the highest point of the structure.
- ▶ Lightning rod need to have independent grounding. DO NOT use the same grounding as devices

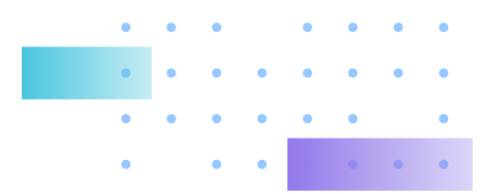




# Surge protector

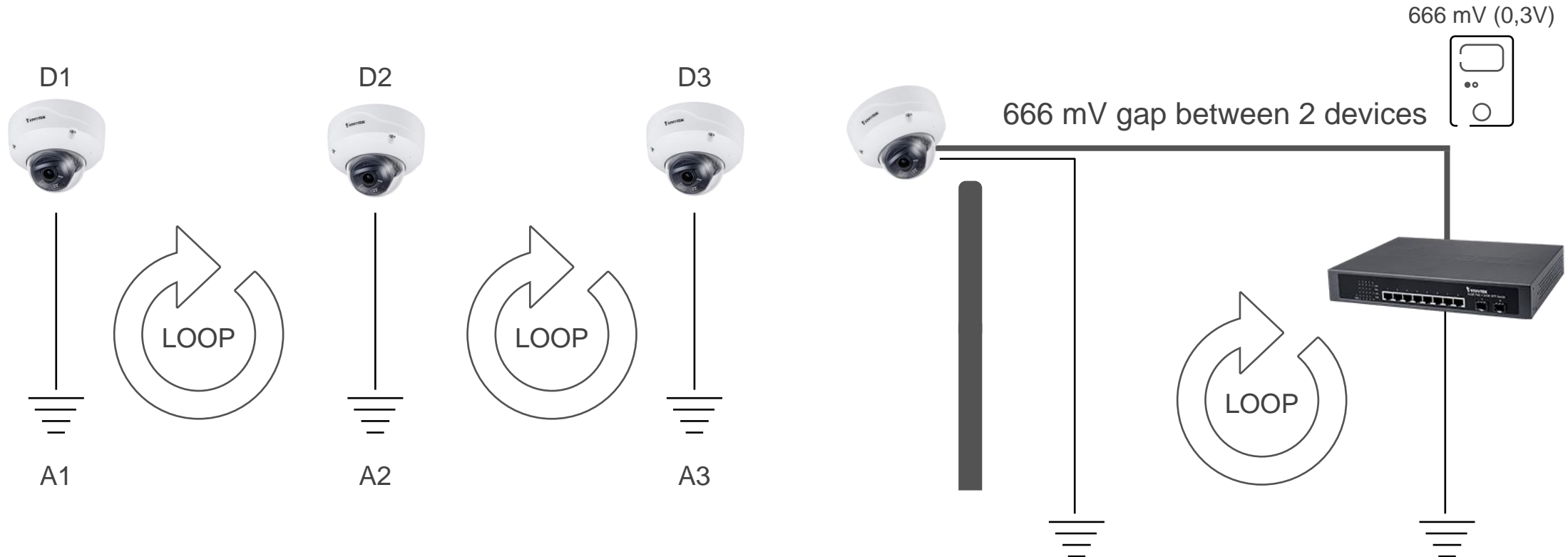
- ▶ Every devices should installed with a surge protector.
- ▶ The distance between camera and surge protector should be less than 1m.
- ▶ Every surge protectors need to connect to grounding point.

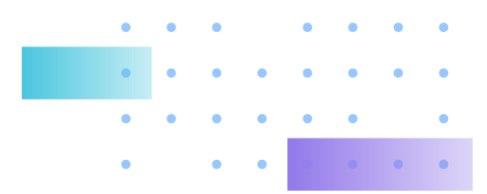




# Bus bar

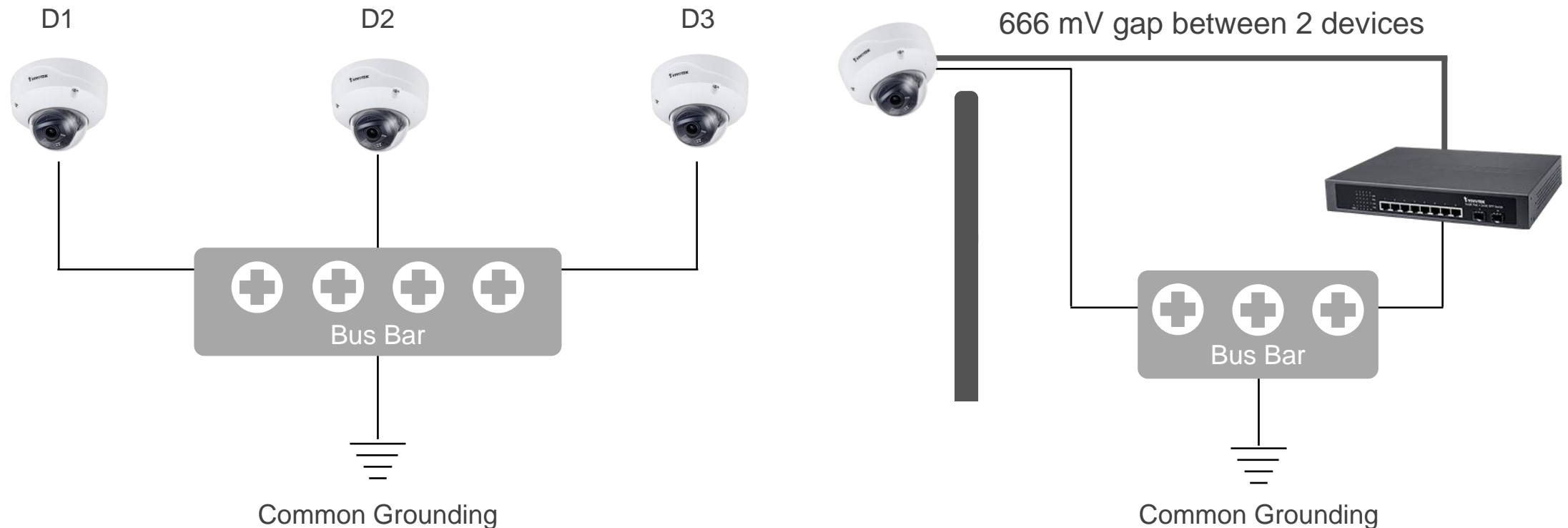
- ▶ In this scenario, these three devices (D1, D2 and D3) are connect together (with a ethernet cable for example) and are grounded to 3 points (A1, A2 and A3).
- ▶ Because these devices are connect to separate ground point, so they have voltage difference and this might causing the Ground Loop occurred.



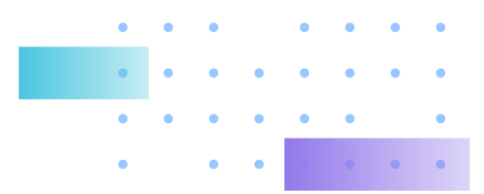


## Bus bar(Cont.)

- ▶ If all the devices connect to one command point (bus bar) instead of connect to ground separately, there's no voltage difference between them.
- ▶ The current will not pass through the ethernet cable between devices and causing loop.



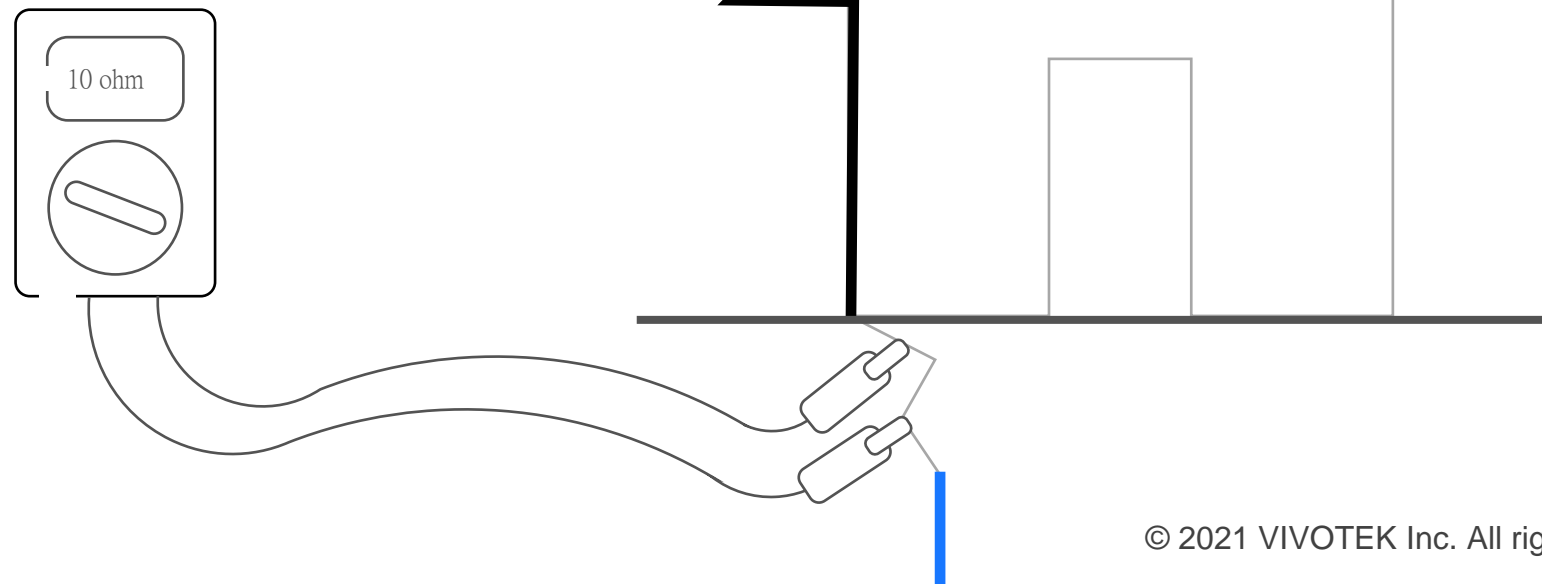




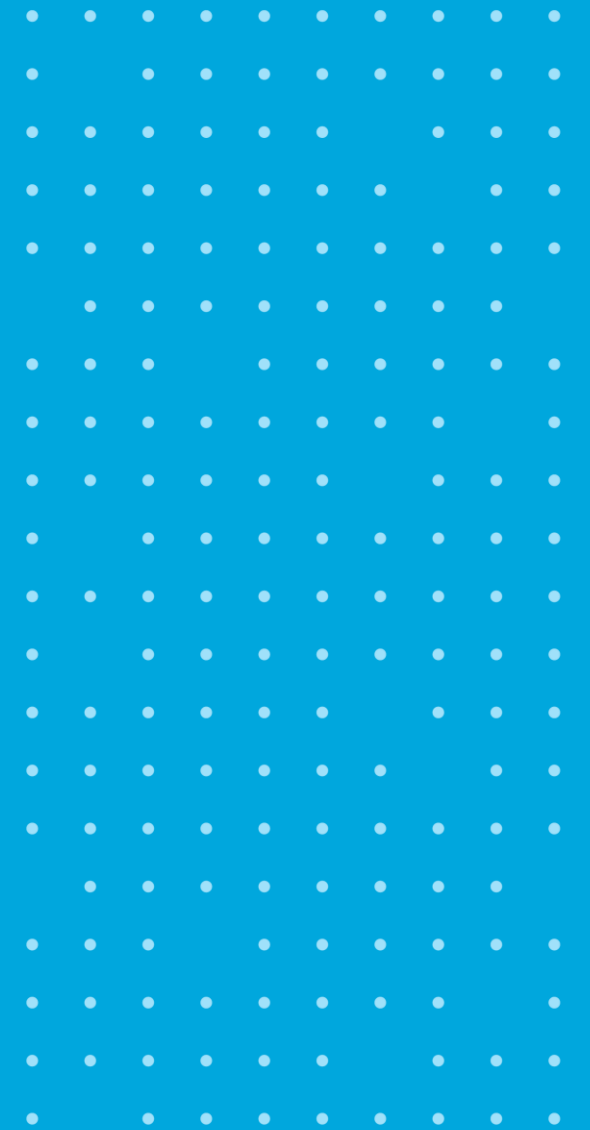
## Grounding Rod

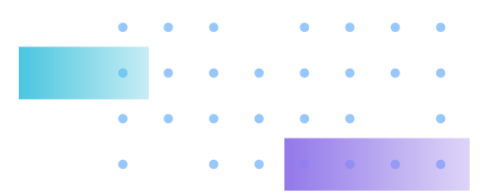
- ▶ Grounding Rod needs to have good electrical conductivity, usually we use copper ground rod because it is cheaper and have good electrical conductivity.
- ▶ Ground Rod resistance value needs to be less than the electrical device. Different country have different specification, usually it is recommended to be less than 10ohm.

Grounding Resistance Tester

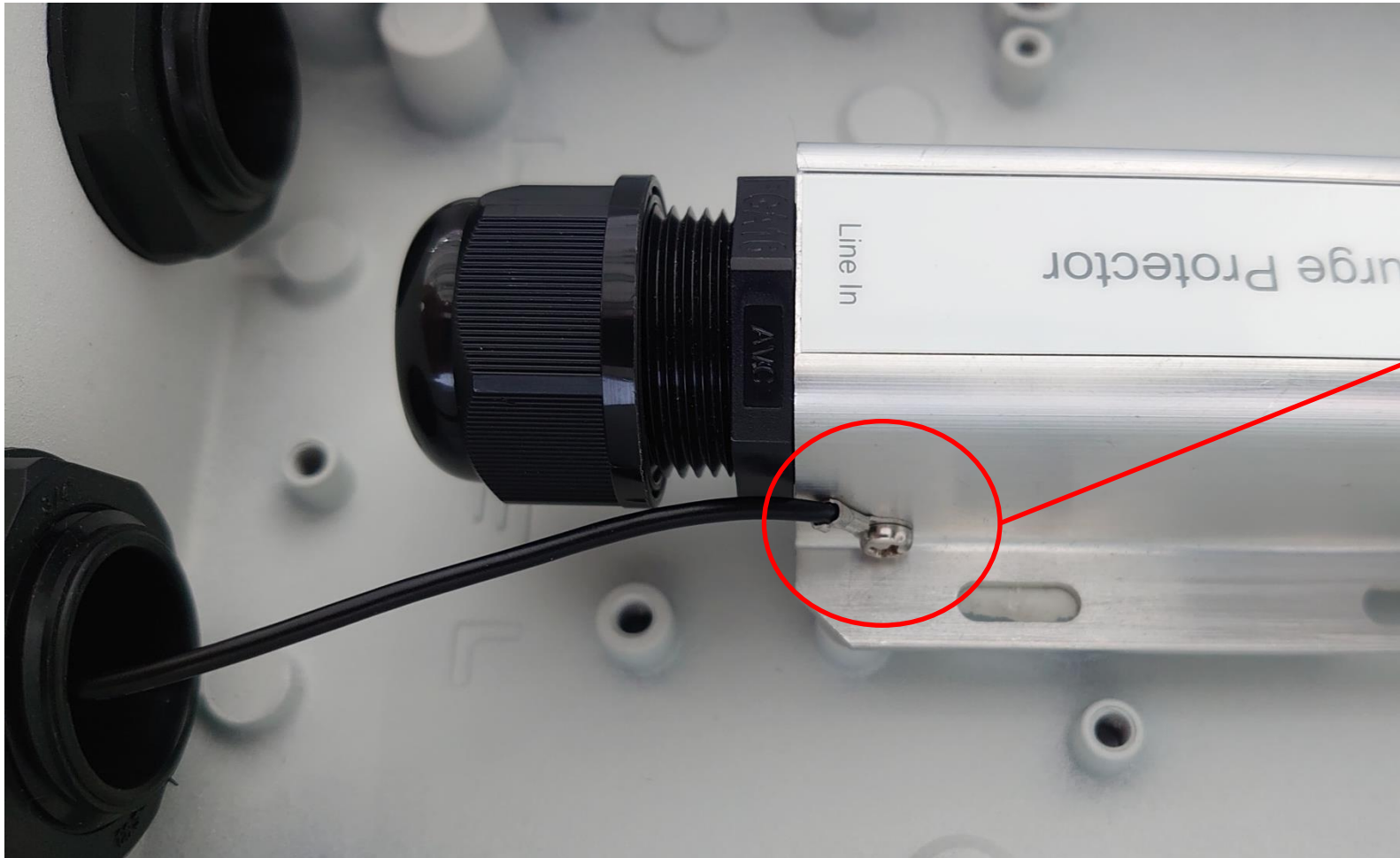


# Good Installation Example



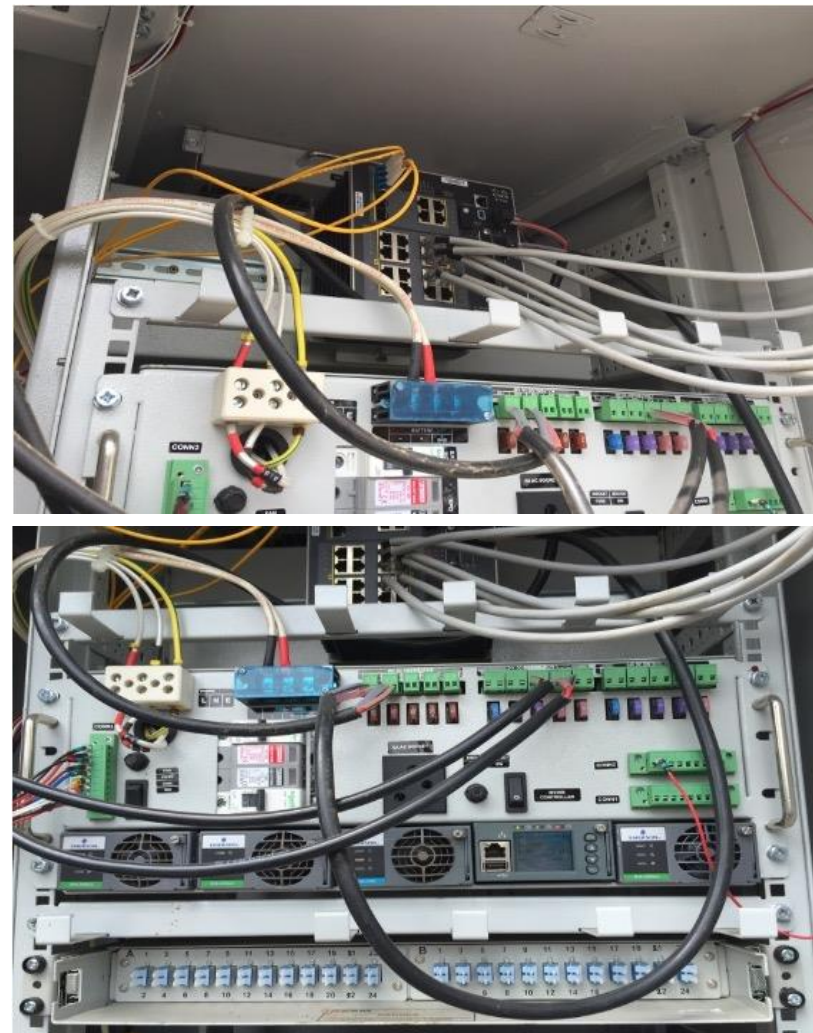


## Surge Protection Grounding Wire in Cabinet



This grounding wire should connect to Bus Bar

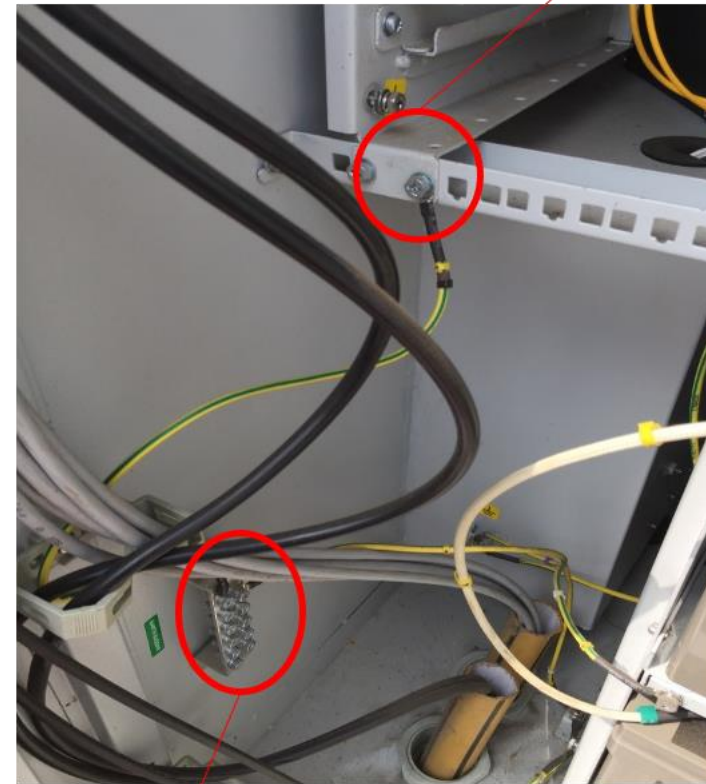
## Well organized within cabin



# All the devices are well grounded

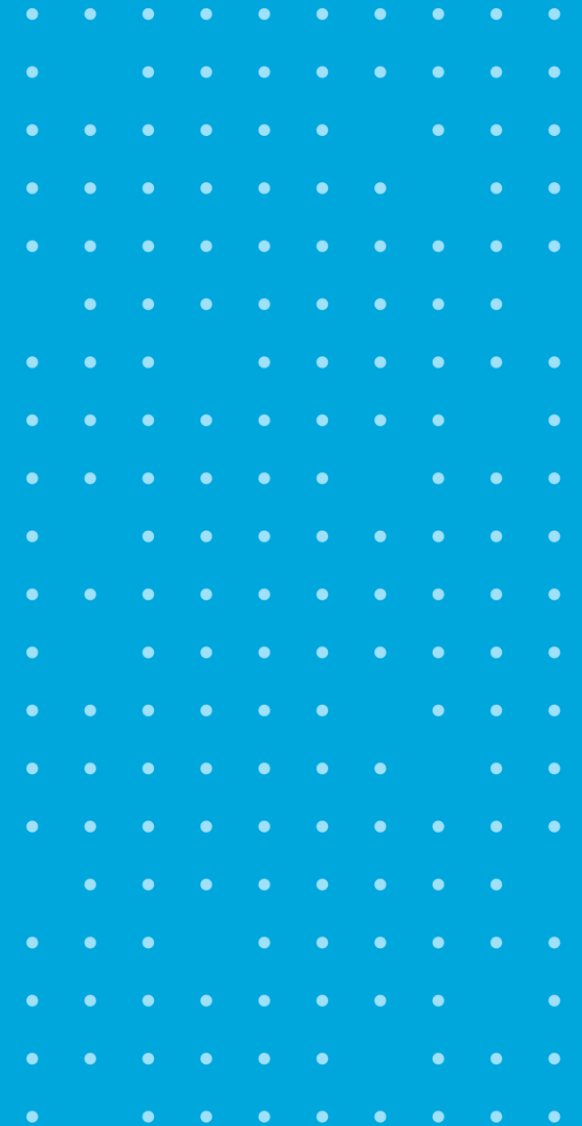


Ground point and connect to Bus bar



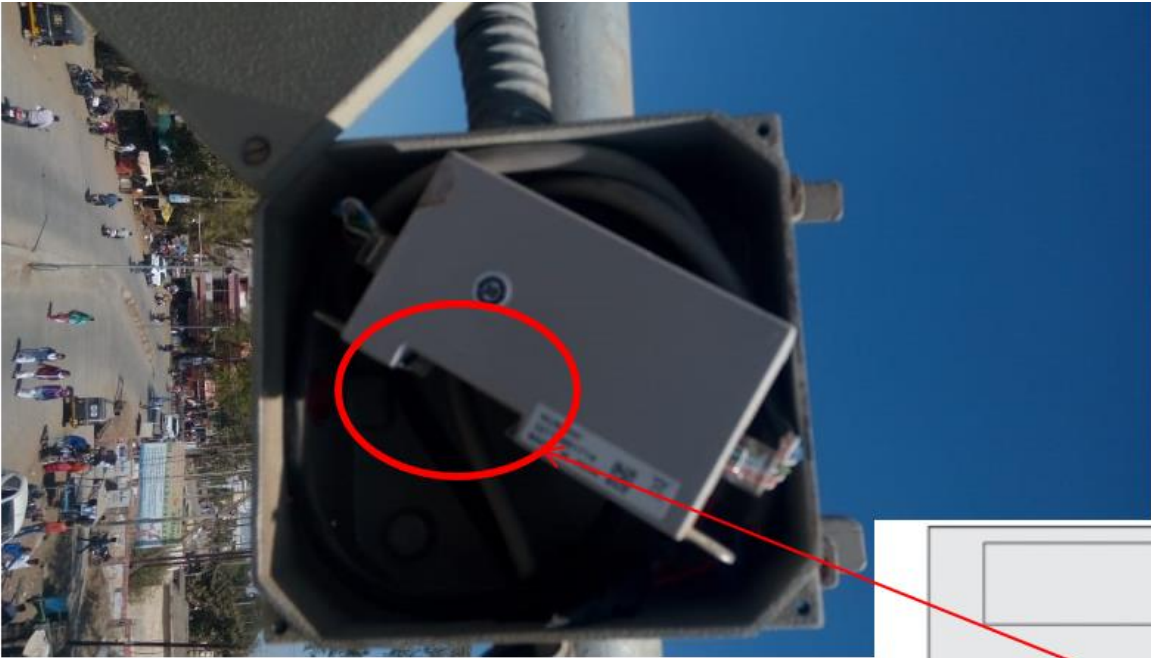
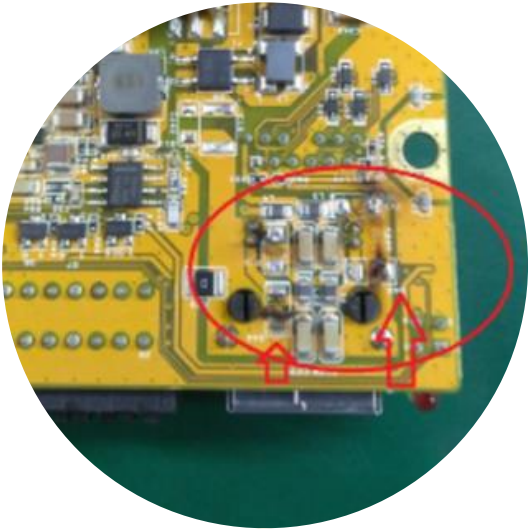
Bus bar

# Bad Installation Example

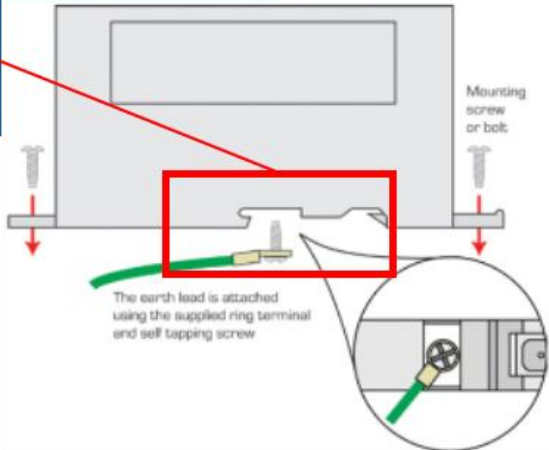


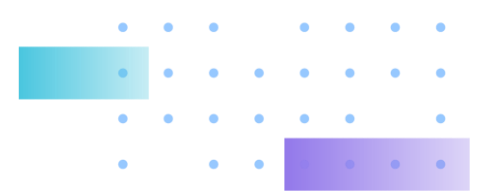


# Case 1 : PCBA burn with MTL surge protector (ZB24585)



Surge protector is not grounded





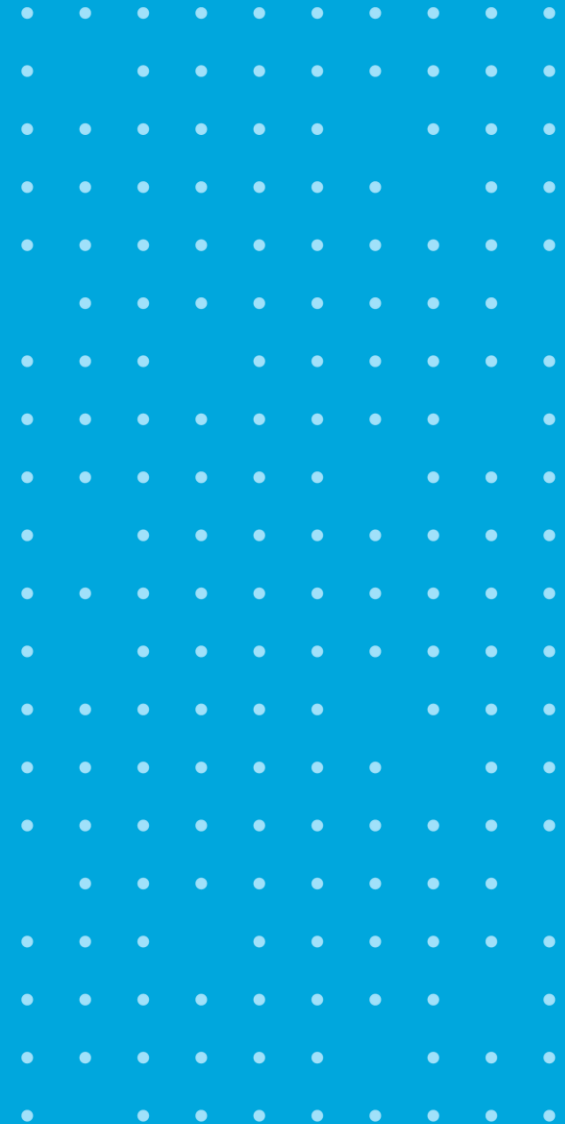
## Case 2 : IP9191-HP PCBA burn (Cont.)

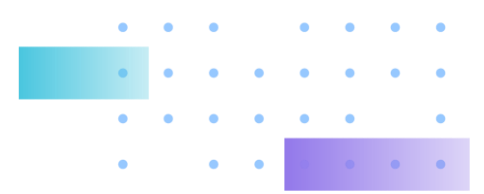


Housing is not grounded and there no surge protector installed



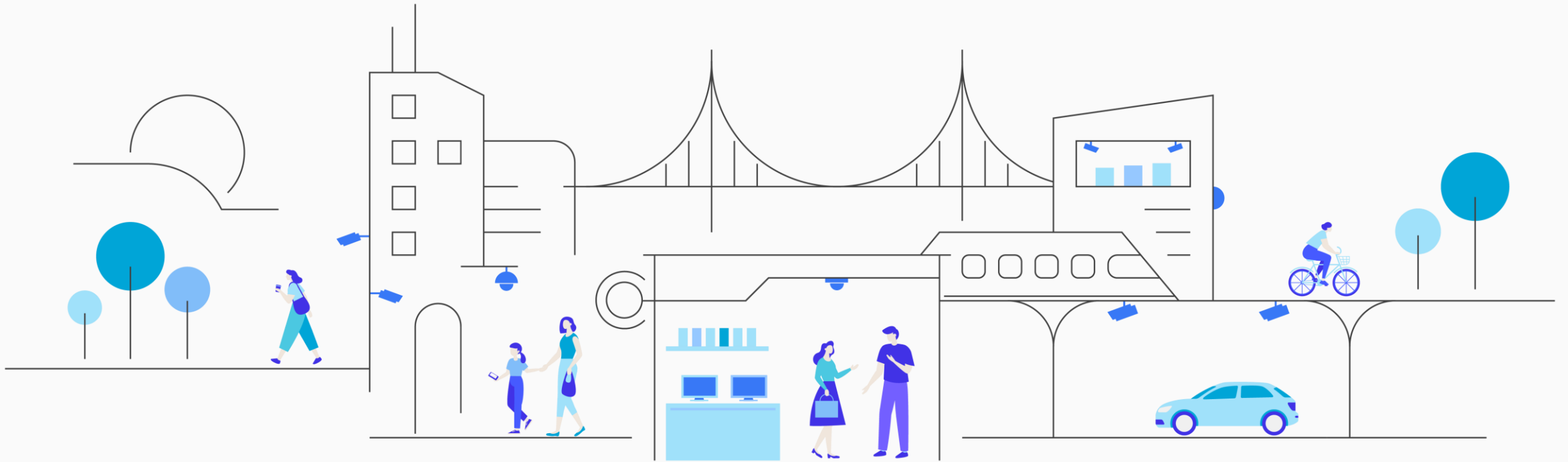
# Information for Trouble Shooting





# Information We Need

Device Information	Structure diagram	Screenshots
<ul style="list-style-type: none"><li>▶ Camera (enclosure)</li><li>▶ Switch</li><li>▶ Surge protector</li><li>▶ Other used devices</li></ul>	<ul style="list-style-type: none"><li>▶ Installed location – outdoor or indoor</li><li>▶ Distance between camera and surge protector</li></ul>	<ul style="list-style-type: none"><li>▶ Installed devices</li><li>▶ Cable connecting point</li><li>▶ Each device's grounding point</li></ul>



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