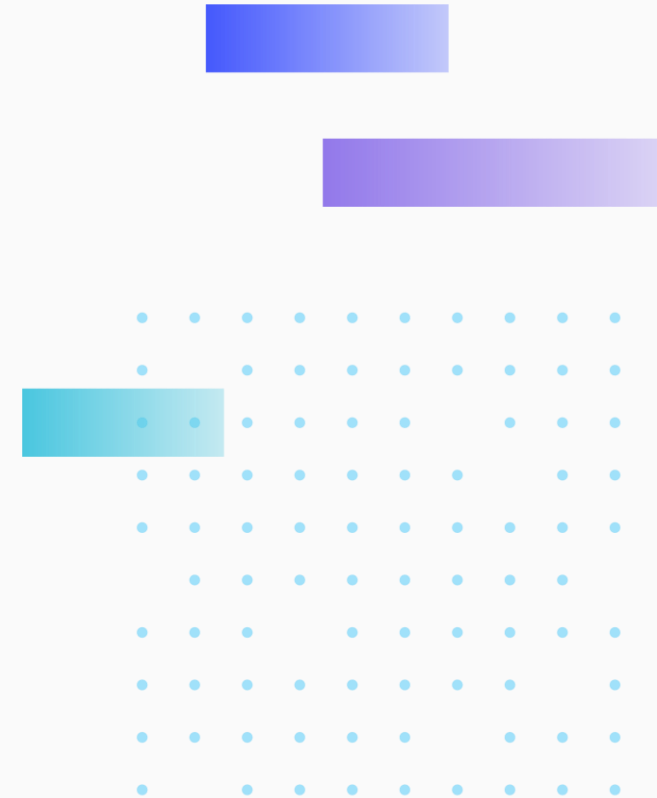


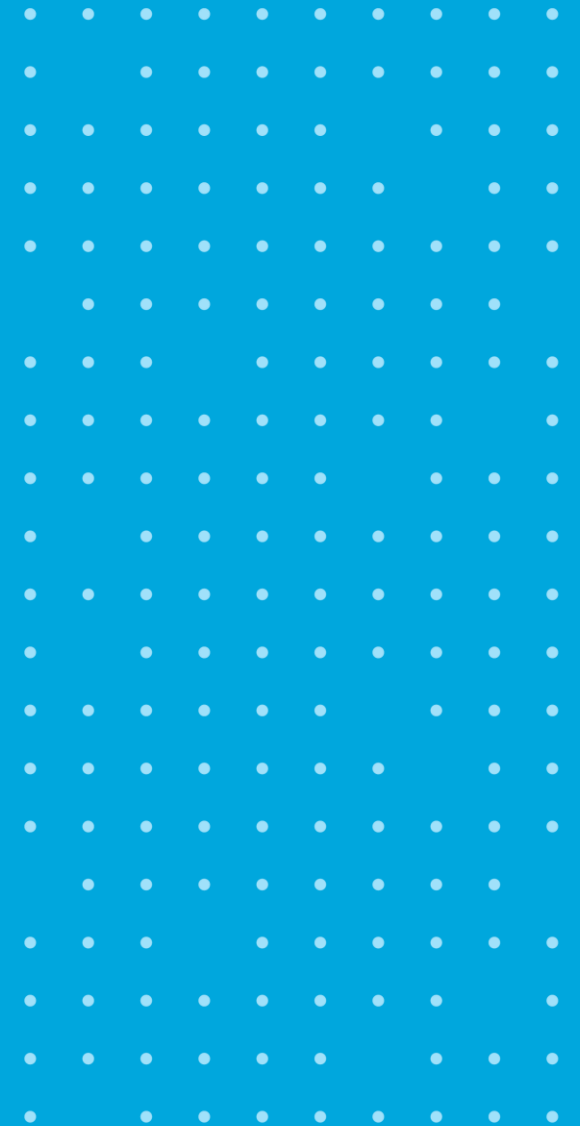
Surge Protection

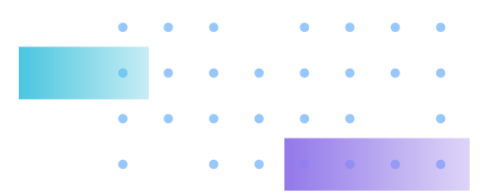
Quick Installation Guide
(Box/LPC Cameras)

Aug 10, 2021



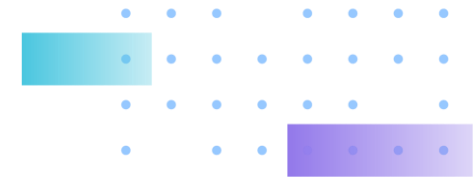
Installation Guide



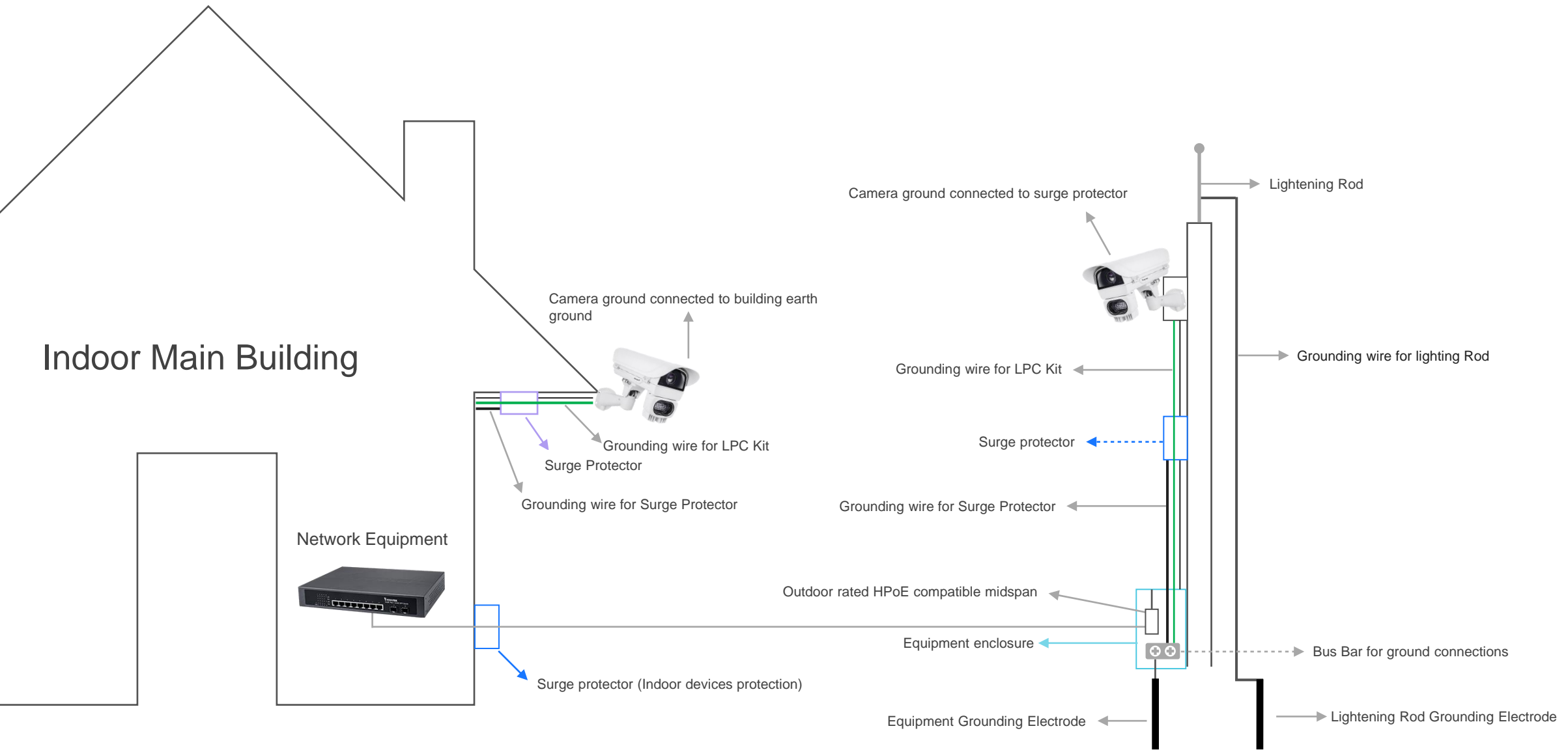


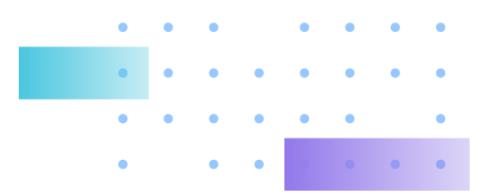
Surge protector installation guide

- ▶ 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.



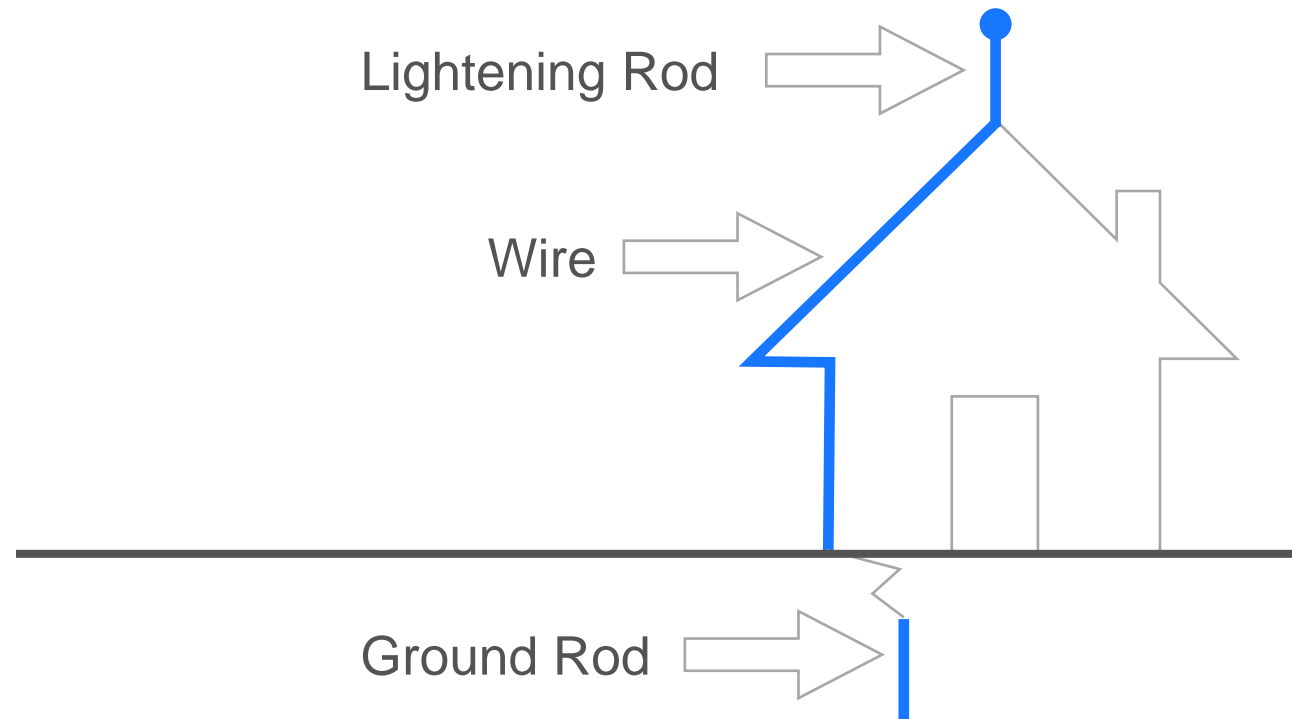
Surge protector installation guide (Cont.)





Lightning rod

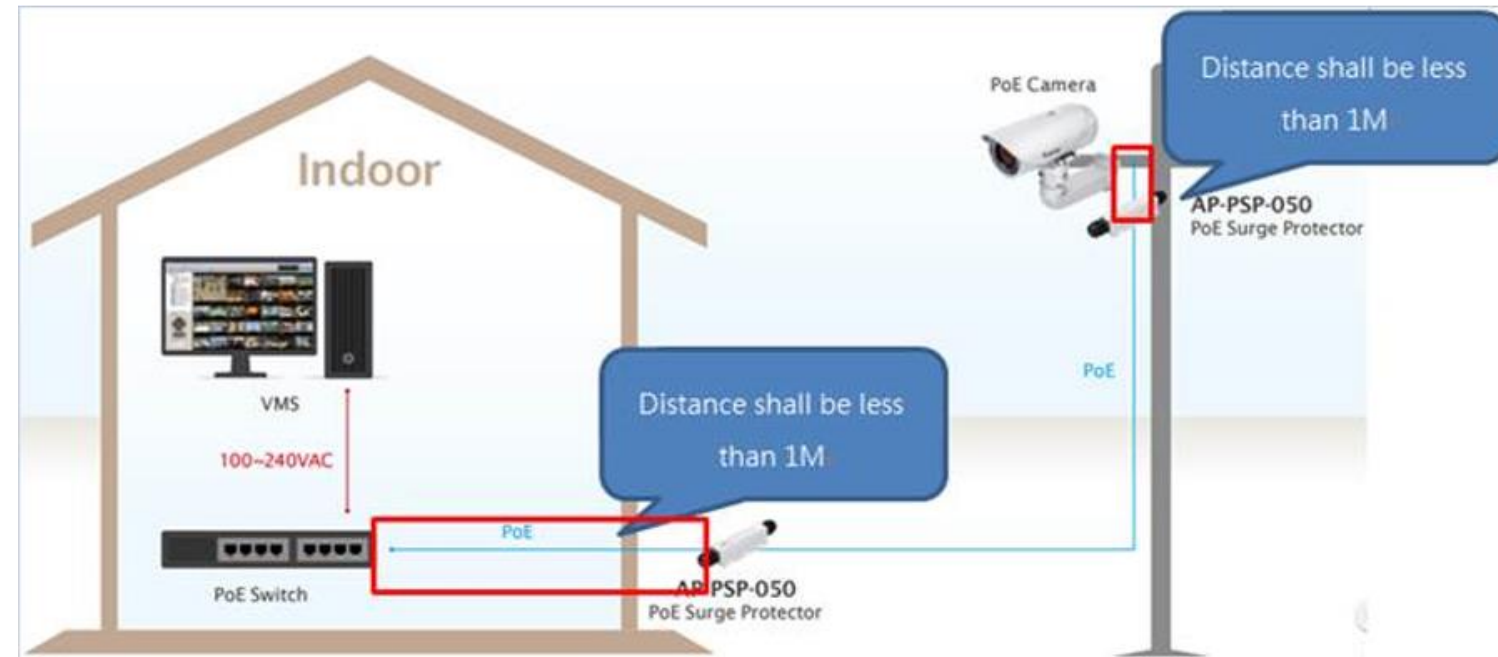
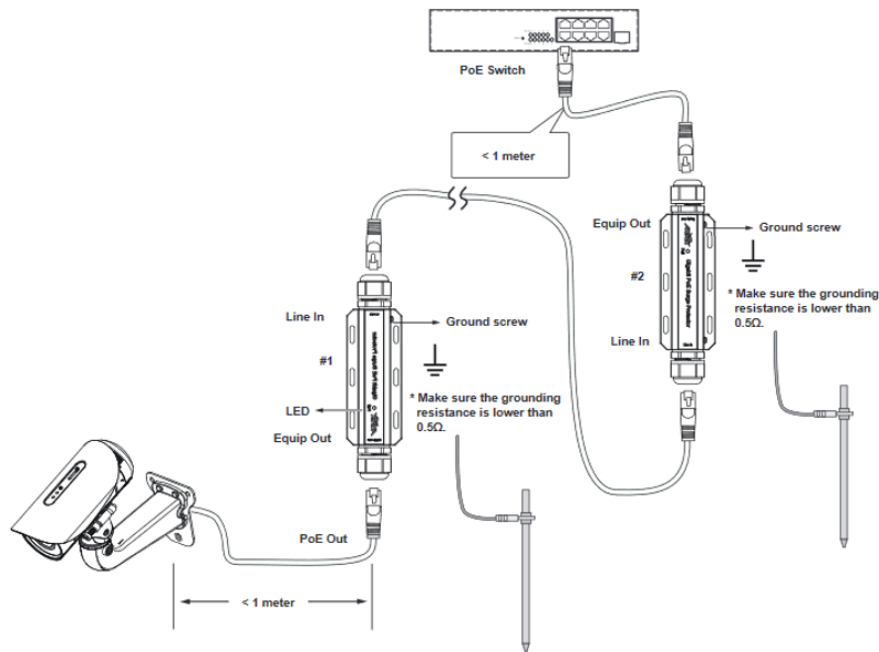
- ▶ Lightning rod should be installed in the highest point of the structure.
- ▶ Lightning rod need to have independent grounding. DO NOT use the same grounding as devices

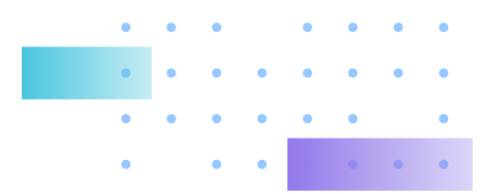




Surge protector

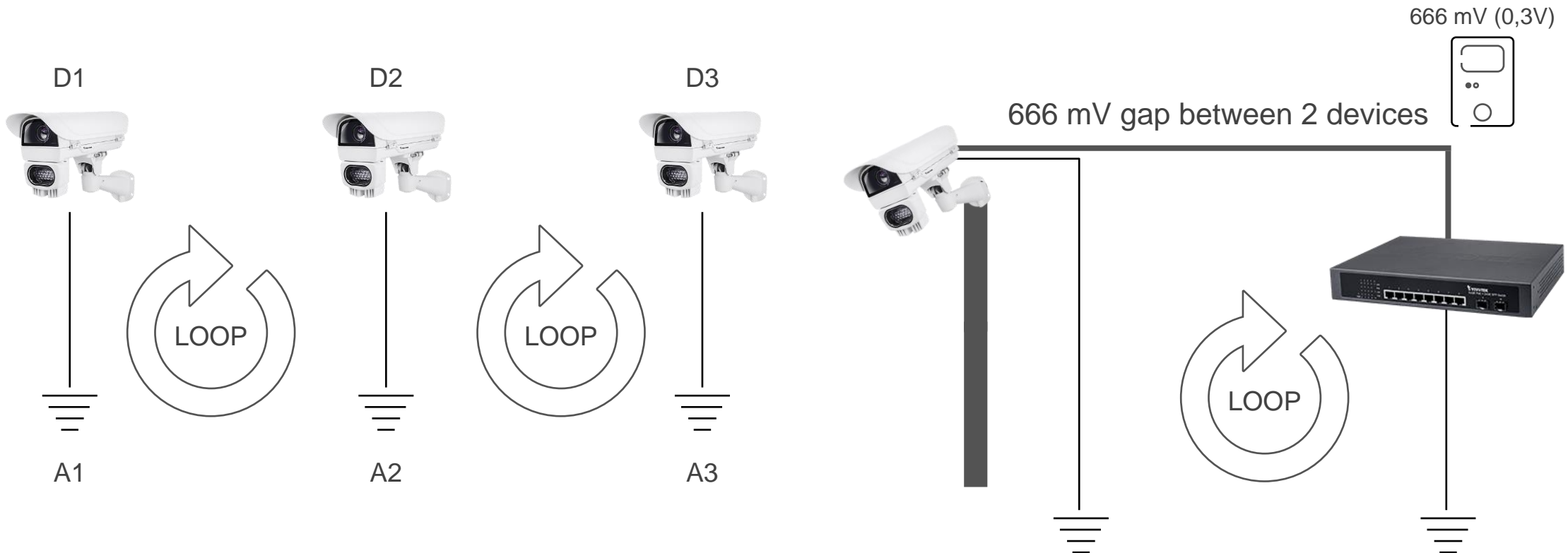
- ▶ Every devices should installed with a surge protector.
- ▶ The distance between camera and surge protector should be less than 1m.
- ▶ Every surge protectors need to connect to grounding point.

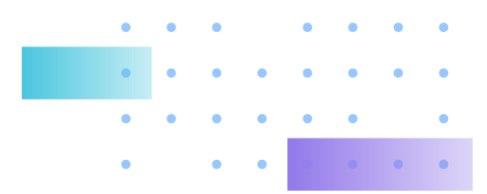




Bus bar

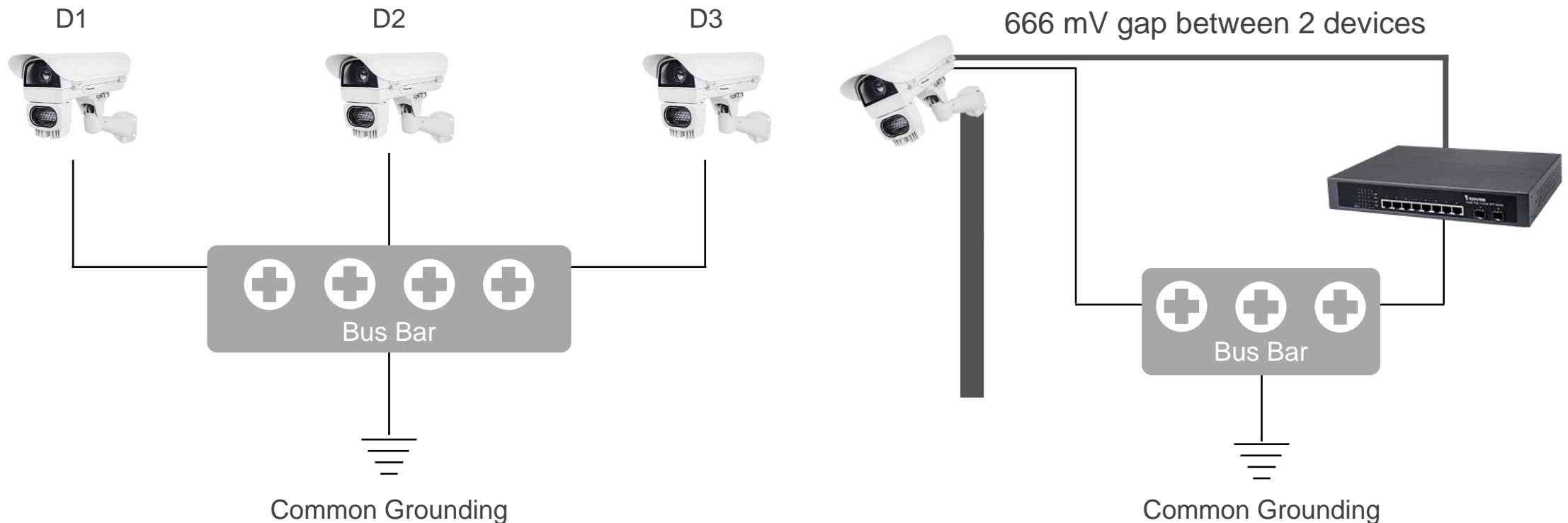
- ▶ In this scenario, these three devices (D1, D2 and D3) are connect together (with a ethernet cable for example) and are grounded to 3 points (A1, A2 and A3).
- ▶ Because these devices are connect to separate ground point, so they have voltage difference and this might causing the Ground Loop occurred.

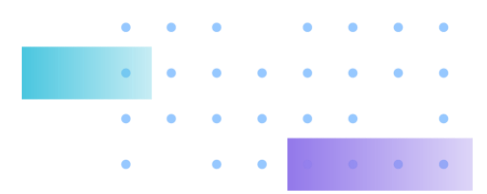




Bus bar(Cont.)

- ▶ 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.

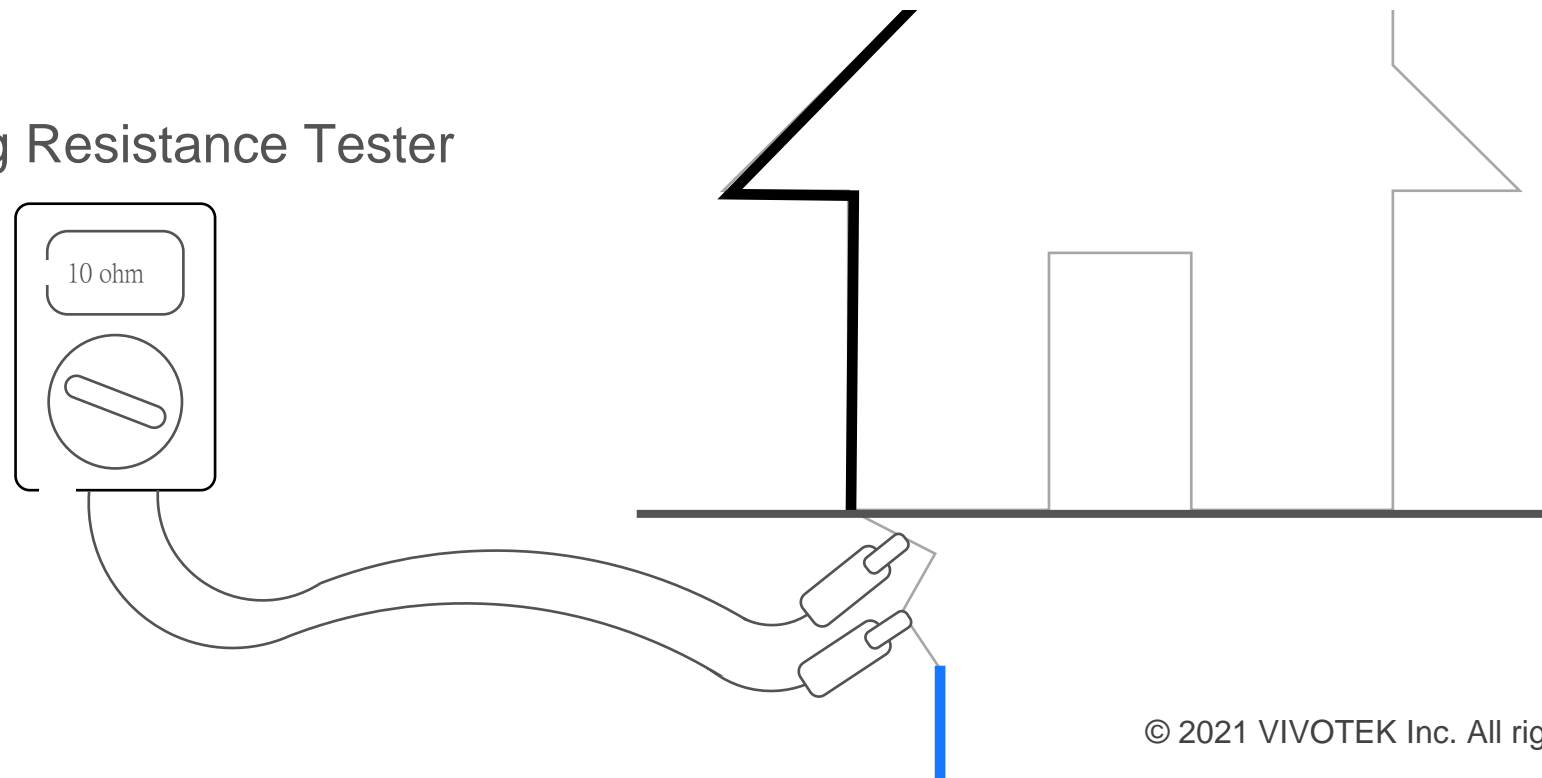




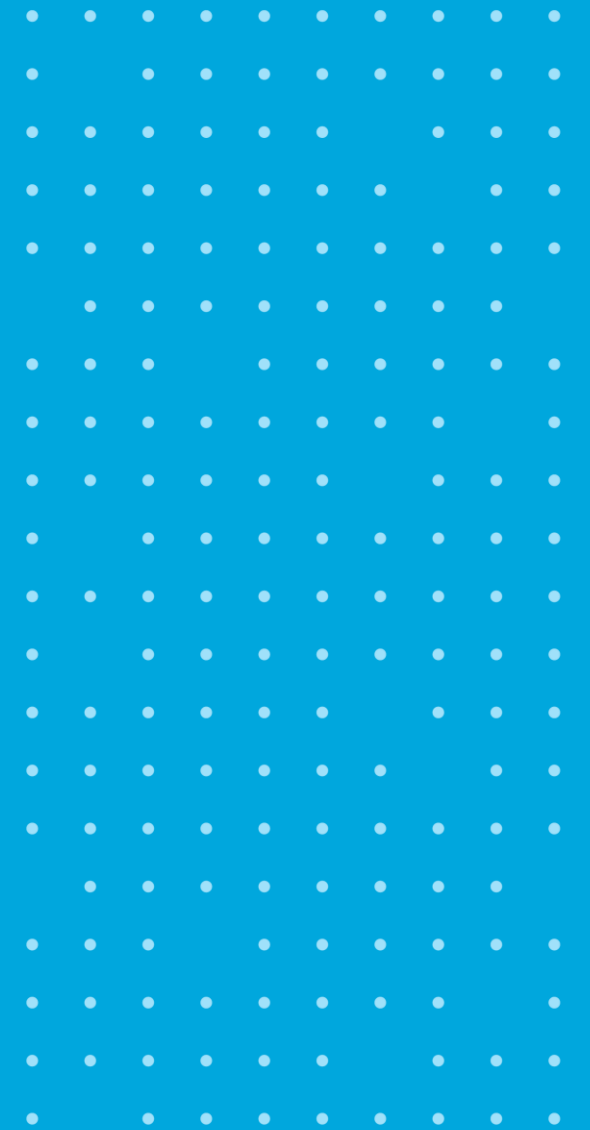
Grounding Rod

- ▶ 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.

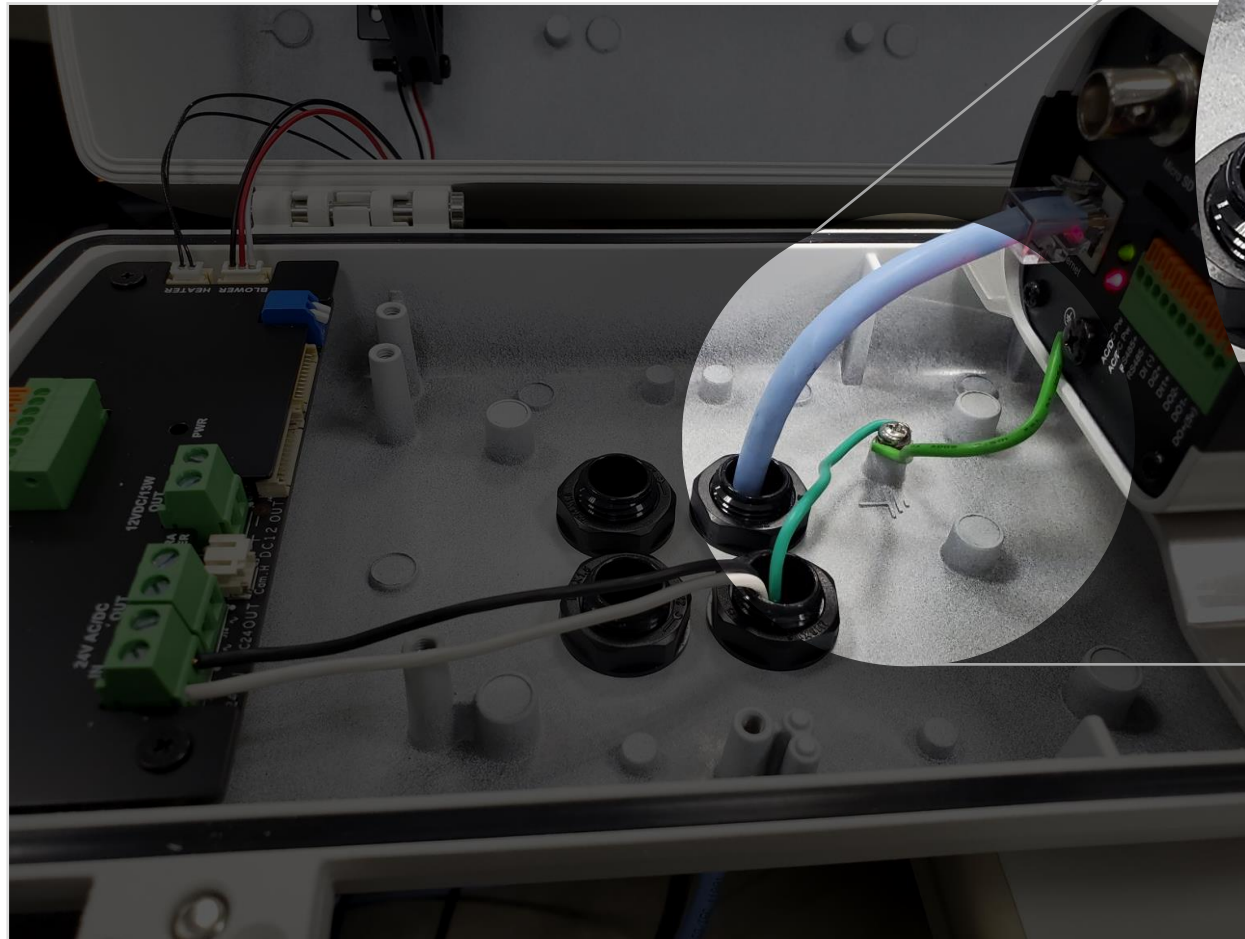
Grounding Resistance Tester

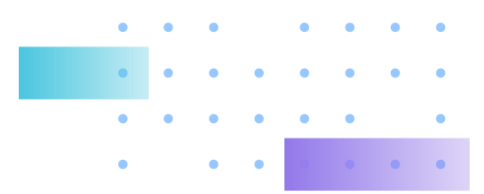


Good Installation Example

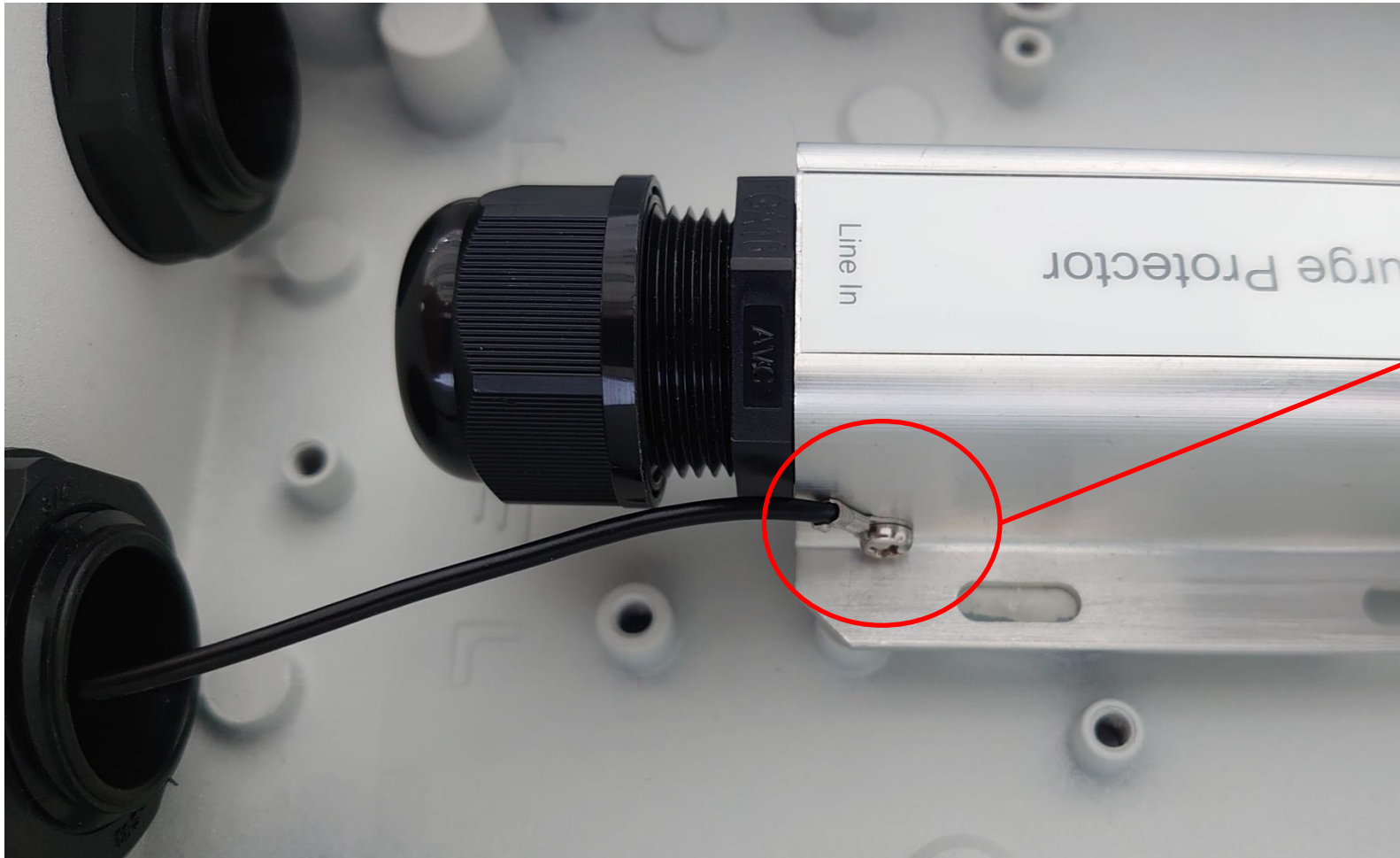


Grounding Wire in LPC Kit



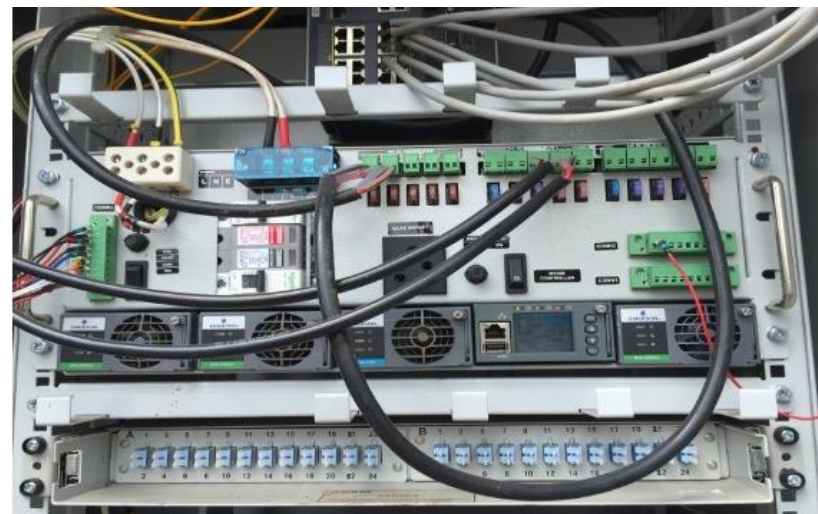
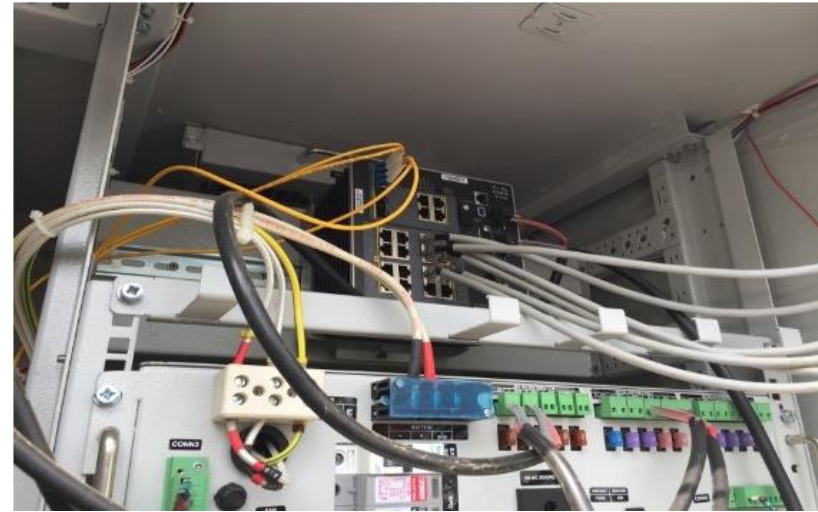


Surge Protection Grounding Wire in Cabinet



This grounding wire should connect to Bus Bar

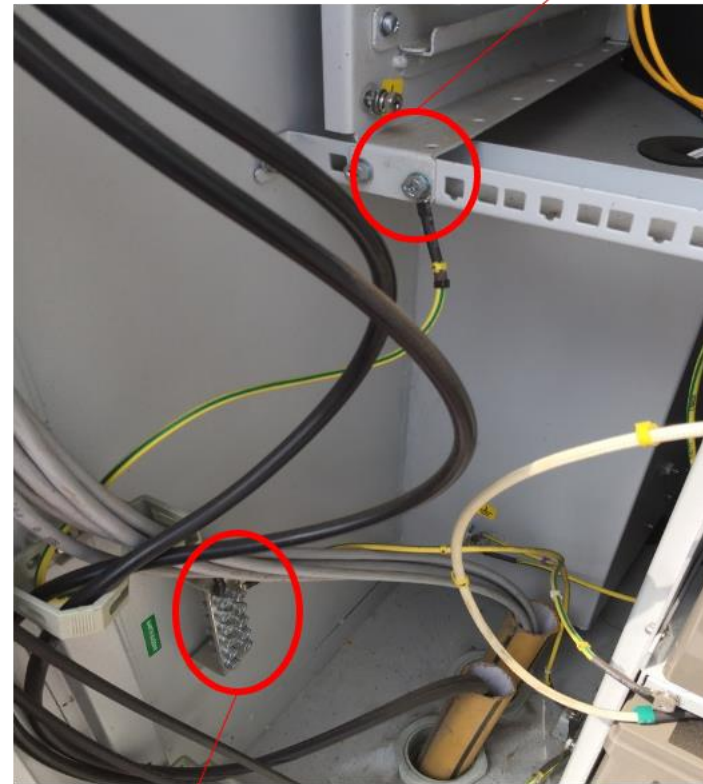
Well organized within cabin



All the devices are well grounded

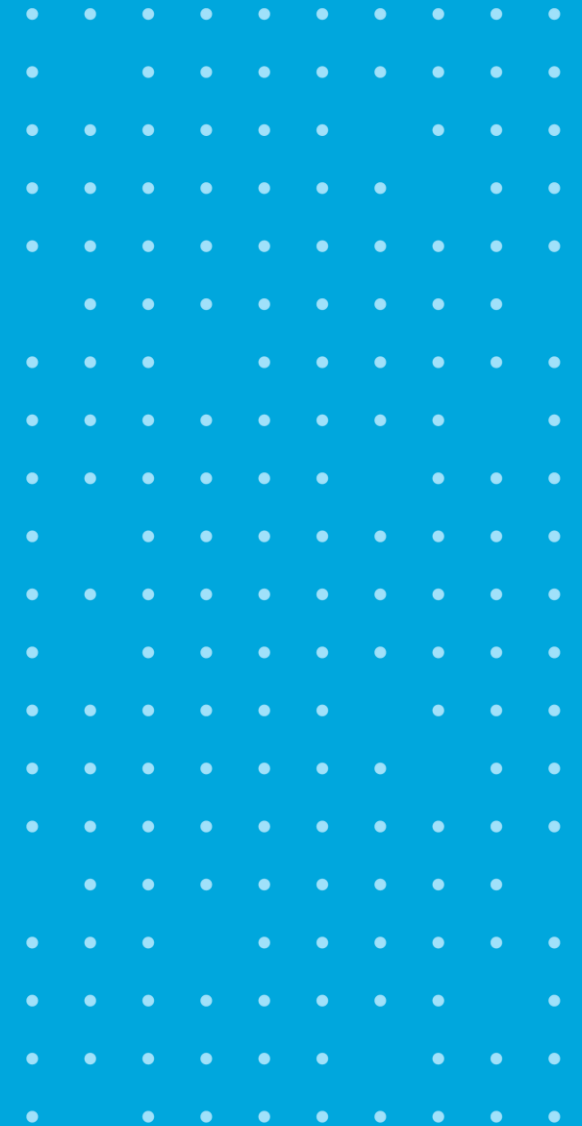


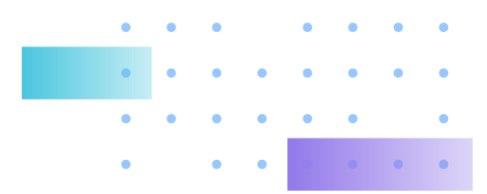
Ground point and connect to Bus bar



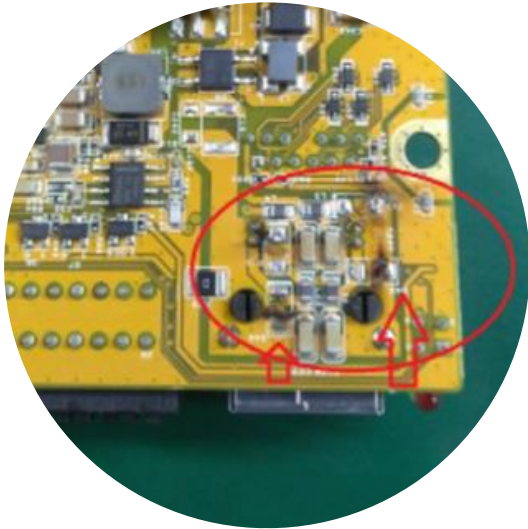
Bus bar

Bad Installation Example

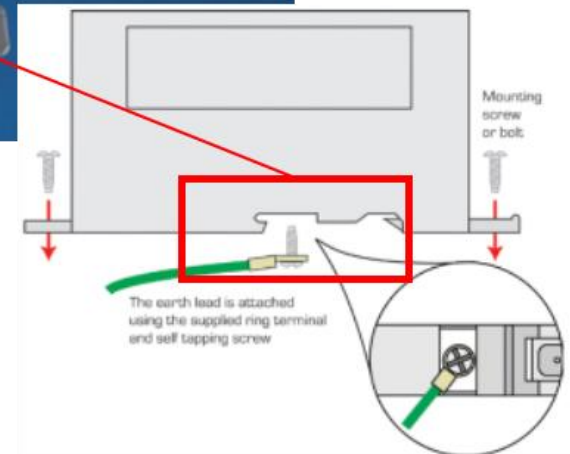




Case 1 : PCBA burn with MTL surge protector (ZB24585)

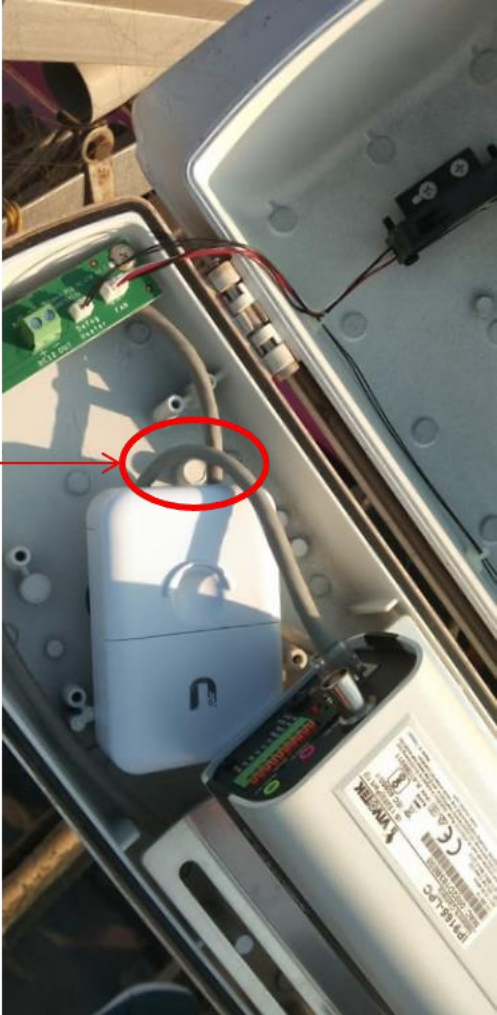


Surge protector is not grounded

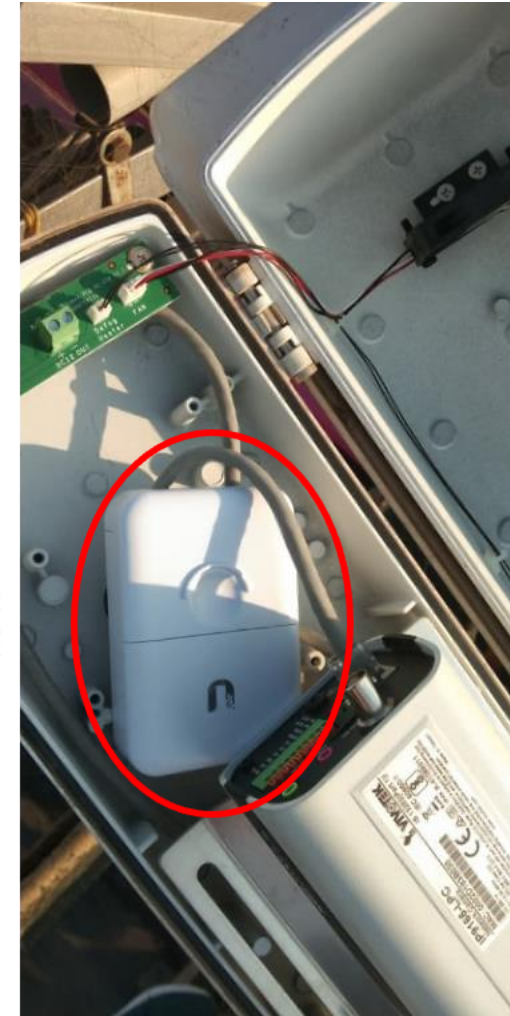
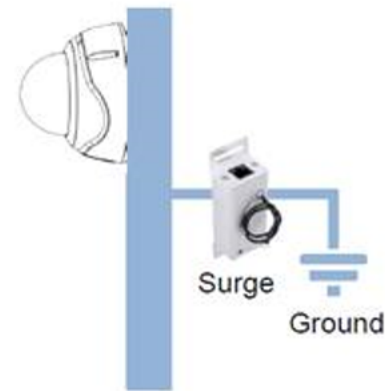




Case 2 : PCBA burn with Ubiquiti surge protector

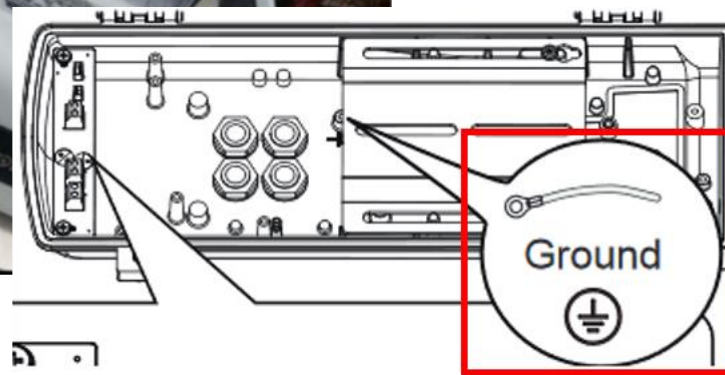
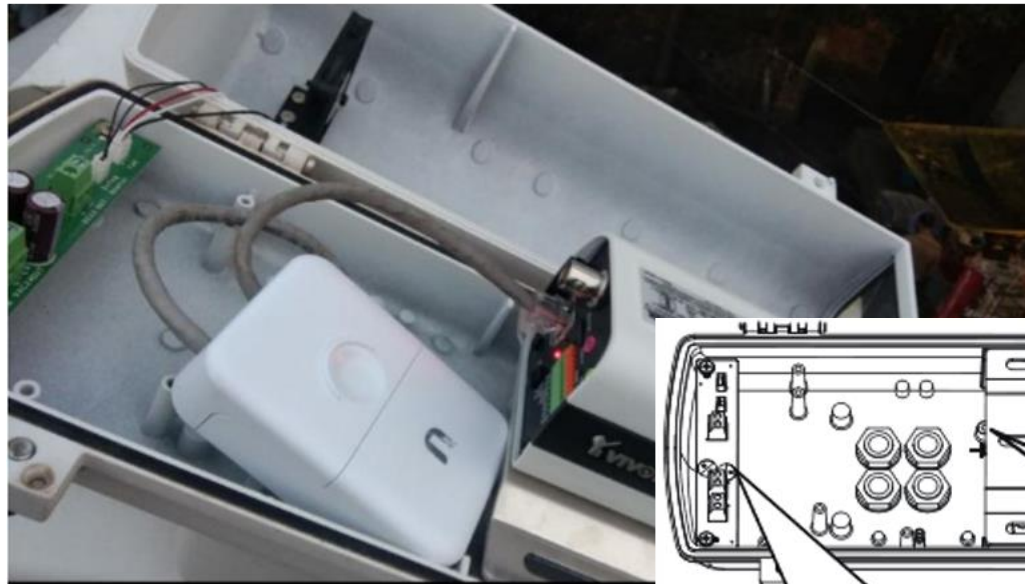


Case 2 : PCBA burn with Ubiquiti surge protector (Cont.)

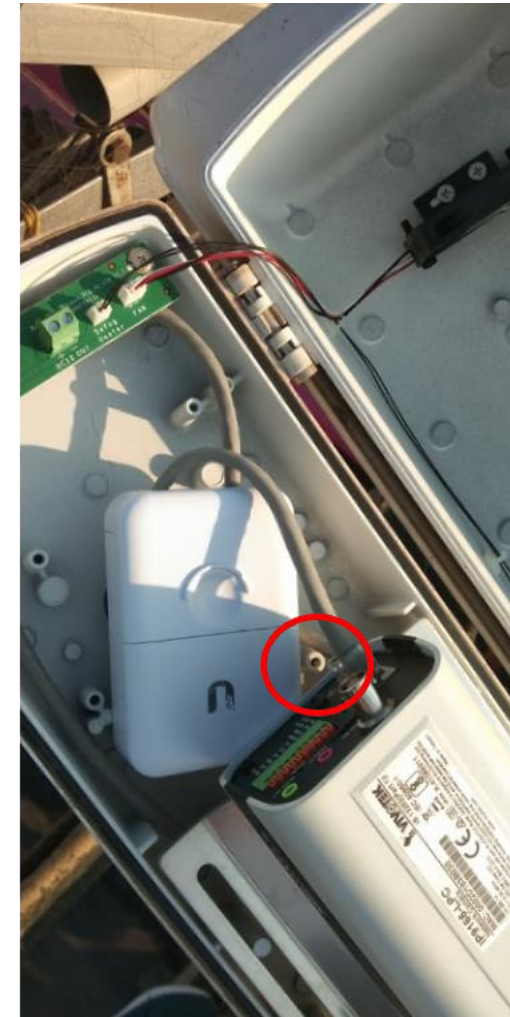


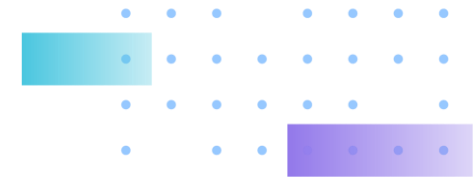
Surge protector shouldn't be placed in the housing

Case 2 : PCBA burn with Ubiquiti surge protector (Cont.)



Housing is not grounded



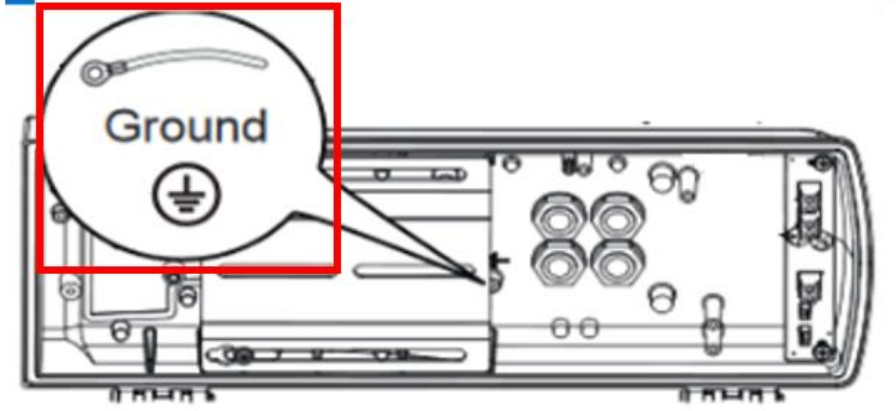
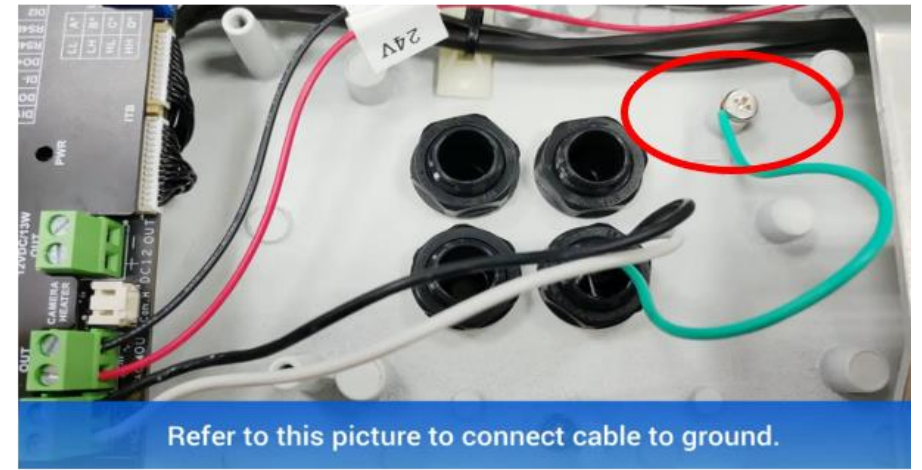


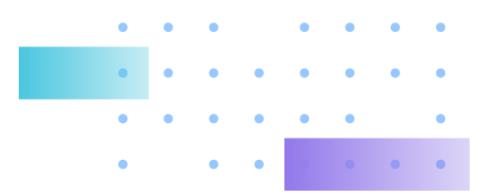
Case 3 : IP9191-HP PCBA burn

Incorrect grounding point

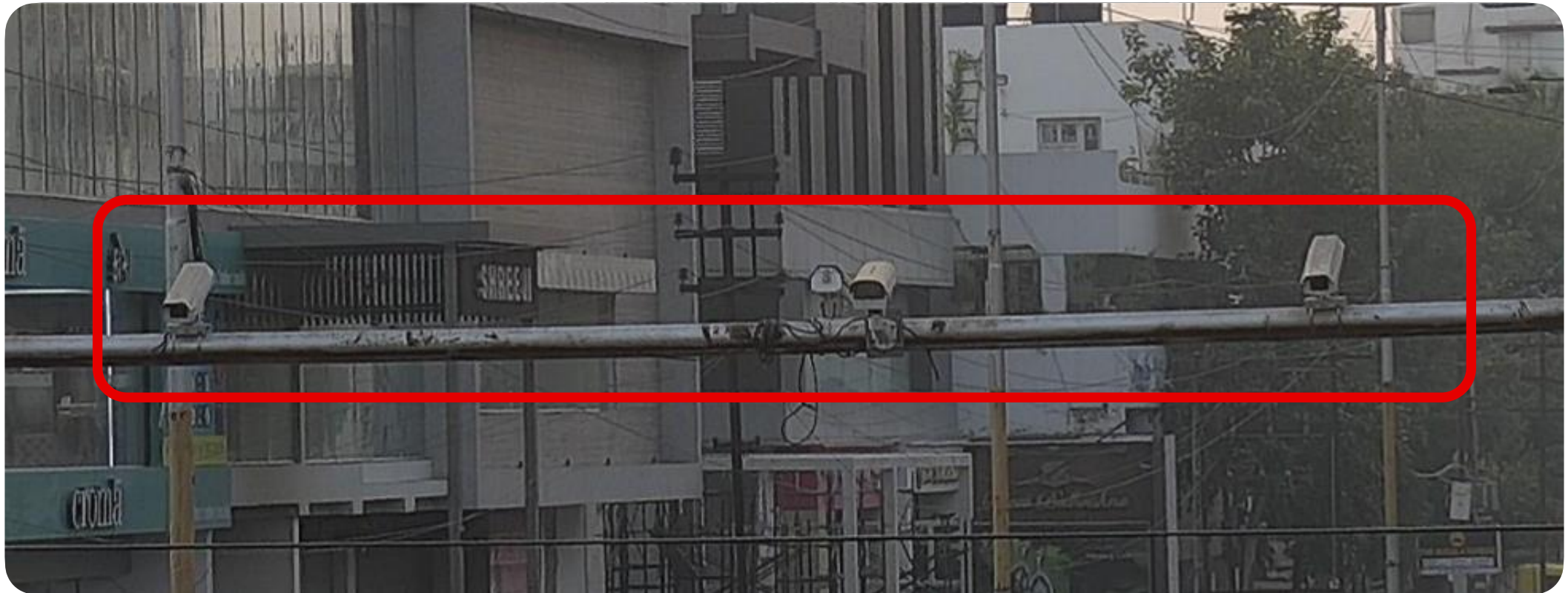


Correct grounding point



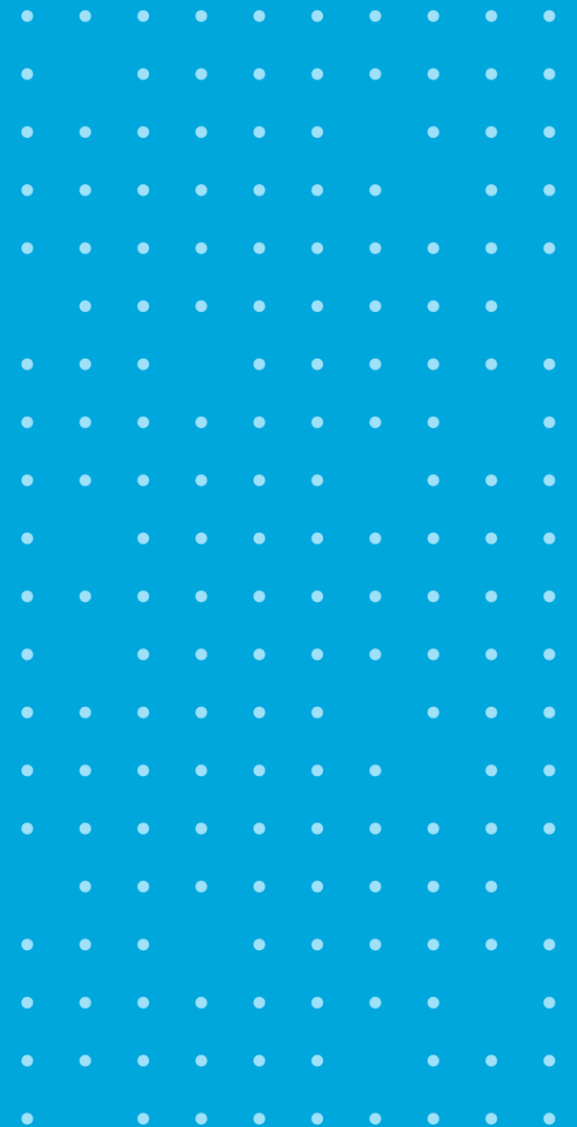


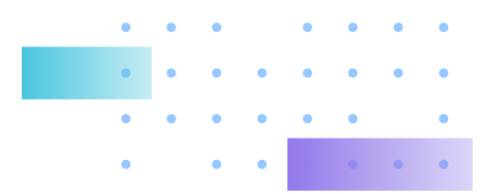
Case 3 : IP9191-HP PCBA burn (Cont.)



Housing is not grounded and there no surge protector installed

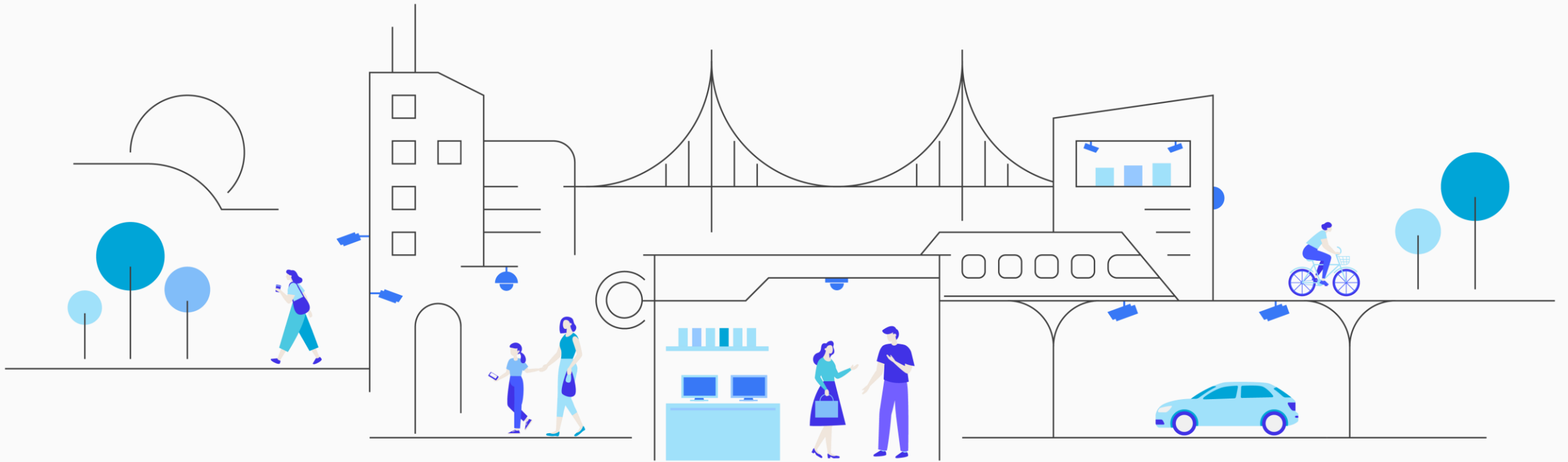
Information for Trouble Shooting





Information We Need

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



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We Get The Picture