

In a lunar environment or in space, the particles present will be extremely small and fine. With such types of particles, dust detection will be of high importance in order to ensure the proper functioning of equipment and the safety of people.

A closely related topic to dust is particulate matter, of which there are many types. Particulate matter detection would further benefit dust detection as a whole. The two main types of particles would be PM 10 and PM 2.5. Both of these particles have their respective sensors which can detect them.

Dust can be detected through multiple methods. For instance, some sensors detect dust by measuring low pulse occupancy time. Low pulse occupancy measures the opacity of the air circulating through the sensor. With this method, multiple sensors would have to be placed throughout the area in order to collect data. Then, the data collected from multiple sensors would have to be represented individually and as an average for the best accuracy.

The data collected by each individual sensor would be represented in the room controller UI. Multiple dust sensors may be needed, depending on the size of the room. On the building controller, averages would be displayed.

When it comes to upper limits and lower limits of dust detection, there doesn't seem to be a defined limit of dust that is harmful to humans or equipment. However, any dust in equipment should be a concern, given that dust in space is more harmful than dust in Earth. Regular cleaning of the equipment and living area would help keep dust under control for human health.