The LiPAPS Particulate Matter (PM) sensor uses optical-based technology and advanced sensor fusion algorithms to sense and count fine particles in the air. When particles travel through the air chamber, a light source illuminates them and records the resulting optical scatter on a photoelectric detector array. Different types of optical scattering occur due to diffraction, refraction, and variations in shape and size of the particles obstructing the beam. Detected particles and their concentration are analysed in real-time by the device and readings are transported via the Vortex Mesh Network\textsuperscript{TM} to Edge Gateways for transmission to the required endpoints. LiPAPS offers continuous real-time, particulate monitoring for harsh environments.
**INTEROPERABILITY**

- Supports Internet Protocol IPv6 and is interoperable with devices that support internet protocol providing transparent network connectivity between nodes.

- 6LoWPAN compliant with physical layer level and MAC satisfying IEEE 802.15.4 standard.

- Uses the MQTT standard (ISO/IEC PRF 20922) for establishing connection in bandwidth-limited networks.

- Sensor devices from other vendors that comply with Thread, 6LoWPAN and IEEE802.15.4 will able to join and establish connectivity with our Vortex Mesh Network™ allowing it to act as a backbone infrastructure for carrying the data generated by 3rd party sensors.

**HARSH ENVIRONMENT PROTECTION**

- Designed for high Ingress Protection rating IP66, where the electronic circuit housing is dust tight and protected against water.

- The particulate sensors have conformal coating and no element is exposed to harsh environmental conditions.

- The sensor particle counter is based on light scattering and is fully glass sealed with no exposure of the internal mechanism to the atmosphere.

- Air tunnels and manifolds are protected by servo-actuated shutters reducing their exposure time to seconds for each measurement.

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**Vortex IoT Edge Architecture**

![Vortex IoT Edge Architecture Diagram](#)