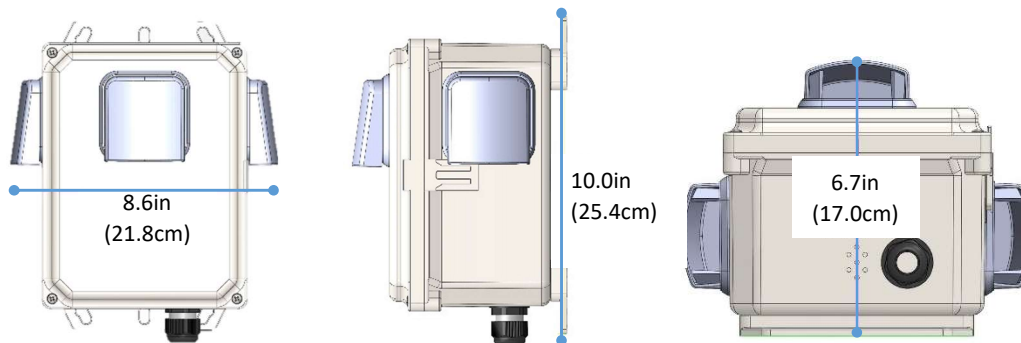# Canary – E
Air Quality Monitoring System

Gen 2   Revised: 6/4/19

I.   Introduction

The Canary-E (Ethernet) is an air quality monitoring system that allows users to take advantage of existing hardwired infrastructure in order to deploy a reliable, secure, cost-effective network of monitors to collect measurements on Particulate Matter, targeted gases, and meteorological data. With a PoE (Power over Ethernet) architecture, power and communication are passed through a single Ethernet connection. Canary-E units can be deployed to create a network of real-time data and integrated into existing customer databases or into Lunar Outpost's custom platform.

II.   Mechanical

8.6in (21.8cm)   10.0in (25.4cm)   6.7in (17.0cm)

A.   Physical Properties

See Table 1.

B.   Mounting Options

The Canary enclosure allows mounting to either tripods, large diameter poles, or DIN rails.

C.   Certifications and Environmental

Table 1: Physical Properties of air quality monitor

Dimension	Value
Width	8.6 in
Height	10.0 in
Depth	6.7 in
Weight	~2.9 lbs

The Canary enclosure meets the following certifications: UL508A, UL 50, CSA-C22.2 No. 14, NEMA 1,2,3,3R,4,4X,5,6,6P,12,13, UL94V-0 Flame rating, and UL746C-F1 UV and submersion testing. The original enclosure before modification had an IP68 rating. The rating after modification is reduced due to the designed addition of vents for airflow, but the unit maintains protections against inclement weather when mounted correctly. The enclosure is UV-Stabilized Polycarbonate and the units have undergone extensive testing in a variety of outdoor environments to ensure robust functionality. Canary units have an operational temperature range of 0F to 140F (-17.78C to 60C).

III.   Power

The Canary-E is designed to be compatible with most POE enabled switches, and POE injector devices. For specific compatibility questions please contact our support team. IEEE 802.3af standard PD device.

IV.   Communication and Data

Canary-E units are designed to be integrated into a variety of networks. One consideration is that Canary-E integration with a city's fiber optic network usually involves collaboration with the technical personnel in charge of the network so data can be sent through firewalls, etc… Lunar Outpost provides engineering support to ensure a seamless integration. Two main types of integration are available. The first, assign each Canary-E an IP and run a script (or program) on a server to collect and forward data to a city's database. The second, allow the Canary-E to communicate with our secure cloud. From the cloud, the data can be routed to the customer's database or Lunar Outpost's custom database. The connection to the cloud is database agnostic, allowing integration with a variety of commercial or custom databases.

A.   Communication

RJ-45/POE port is utilized for both power and communication and is compatible with Cat 5 and Cat 6 cables.

B.   Data

The Canary-E allows for data integration into the platform of choice and puts data ownership and control in the customer's hands. JSON formatting is used for the data unless otherwise requested by the customer. Micro-SD capability allows for data-backups and redundancy storing up to 7 years of data locally.

- **Integrate to client database:** Canary-E data can be routed to a customer's existing database or routed to multiple databases simultaneously.
- **Lunar Outpost's custom database:** Lunar Outpost's custom database is an effective, user friendly platform that allows customers to view, interact with, and download data.

V.   Sensors

The following sensors are integrated into every Canary-E base unit.

Table 2: Integrated Sensor Specs

Property	Range	Resolution
PM2.5	0~1000 µg/m³	1 µg/m³
PM10	0~1000 µg/m³	1 µg/m³
Temperature	-40 to 85 °C (-40 to 185°F)	+/-1.5 °C (2.7 °F)
Humidity	0-100% RH	+/-3%
Atmospheric Pressure	300-1250 hPa (mbar)	+/-1.7 hPa (mbar)

The following sensors can optionally be added to any Canary-E.

Table 3: Optional Sensor Specs

Property	Range	Resolution
Total VOC (tVOC)	0 to 50 ppm	1 ppb
Ozone (O_3)	0 to 20 ppm	15 ppb
NO_2	0 to 20 ppm	15 ppb
CO	0 to 1000 ppm	4 ppb
CO_2	0 to 5% volume	1 ppm
H_2S	0 to 100 ppm	5 ppb
SO_2	0 to 100 ppm	5 ppb
Wind Speed	0-75 m/s (0-168mph)	0.01 m/s
Wind Direction	0-360 deg	+/- 2 deg

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