



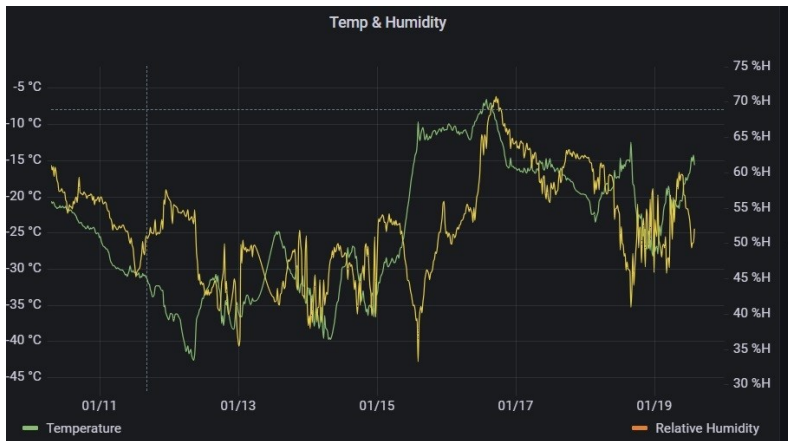
# TERRAAIR

## AIR MONITORING SYSTEMS

### Cold Weather Testing of Air Monitoring Equipment

**Abstract:** This white paper presents the findings from cold weather testing conducted on the TerraAir monitoring equipment. The testing confirms battery life, charging ability, and sensor accuracy under harshly cold temperatures, demonstrating the equipment's performance. These results assure reliability and precision, even in the most extreme cold conditions.

**Introduction:** The TerraAir solar-powered air monitor provides continuous, outdoor air monitoring using multiple sensors. Equipped with both WiFi and LTE Communication, LTE was used for this test. The acquired data was sent to the cloud where it was databased and accessed by a customized dashboard. Multiple air monitors were tested during these extreme weather conditions to verify the results.



#### Key Considerations in Cold Weather Testing:

- Temperature range: Determining the appropriate range for testing based on geographical locations and anticipated weather conditions.
- Testing duration: Ensuring sufficient duration to assess equipment performance under prolonged cold exposure. cold weather conditions.
- Sunlight Hours: Sufficient solar energy during daytime.

#### Challenges of Cold Weather on Air Monitoring Equipment:

- Effects of low temperatures on sensor accuracy and response time.
- Potential damage to equipment components due to freezing temperatures.
- Impact on power supply and battery life.



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**Testing Methodology:** During this test, we took advantage of an exceptionally frigid arctic air mass that lingered over the test site for approximately 2 weeks. This white paper focuses on the coldest segment of this period. We tested environmental and particulate matter sensors, LTE communication, battery longevity, solar charging, and anemometer functionality. Temperature variations spanned from -10 degrees Celsius to as low as -43 degrees Celsius. We employed independent testing equipment to validate these temperature extremes.

**Conclusion:** The battery performance remained unaffected by the extreme cold temperatures, demonstrating resilience in the face of challenging conditions. Solar charging proved to be effective, reliably replenishing the batteries during daylight hours. Throughout the testing period, particulate matter monitoring and environmental sensors operated smoothly and consistently. Additionally, LTE communication remained unimpacted, maintaining reliable connectivity throughout the duration of the test.

