

# Accurate PM and NO<sub>2</sub> measurements, anywhere you need them

Clarity's flagship particulate matter (PM) and nitrogen dioxide (NO<sub>2</sub>) sensor is self-powered, FCC/CE-certified, MCERTS-certified, UV-resistant, and weatherproof.

A self-sufficient IoT air quality monitoring device with solar harvesting, an internal battery, and global cellular connectivity, the Clarity Node-S requires minimal maintenance and operates seamlessly even in remote locations. We're so confident in the Node-S's ability to amaze, our solution comes with free hardware replacements.



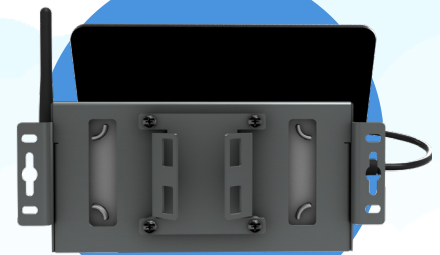
## SOLAR-POWERED & CELLULAR-CONNECTED

Pre-configured with integrated solar power harvesting, batteries, and global cellular connectivity to get up and running quickly without external infrastructure.



## MCERTS-CERTIFIED FOR ACCURACY

Complies with MCERTS Performance Standards for Indicative Ambient Particulate Monitors (CSA MC230425/00) for both PM<sub>2.5</sub> and PM<sub>10</sub>.

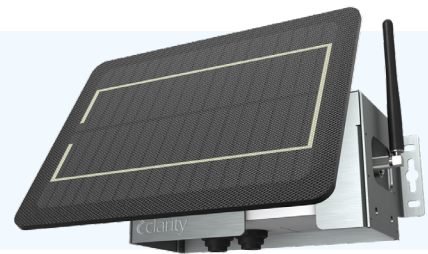


## WARRANTIED, ROBUST & WEATHERPROOF

Rugged, weatherproof devices for seamless operation and minimal maintenance even in remote locations, with free servicing and replacement of equipment under warranty.



# Node-S Technical Specifications



## AIR QUALITY MEASUREMENTS

PARAMETER	TECHNOLOGY	RANGE
<b>Particulate Matter</b> PM <sub>2.5</sub> [µg/m <sup>3</sup> ]  <b>MCERTS-Certified</b> <b>CSA MC230425/00</b>	Laser Light Scattering with Remote Calibration	<ul style="list-style-type: none"> <li>0-1000 µg/m<sup>3</sup></li> <li>1 µg/m<sup>3</sup> resolution</li> </ul>
<b>Nitrogen Dioxide</b> NO <sub>2</sub> [ppb]	Electrochemical Cell with Remote Calibration	<ul style="list-style-type: none"> <li>0-3000 ppb</li> <li>1 ppb resolution</li> </ul>

## PERFORMANCE BY CALIBRATION TYPE\*

	PRE-CALIBRATED <sup>1</sup>	CUSTOM COLLOCATION
<b>R<sup>2</sup></b>	Optimal Conditions: 0.97 Typical Conditions: > 0.7	<b>R<sup>2</sup></b> { Optimal Conditions: 0.94 Typical Conditions: > 0.7
<b>RMSE</b>	Optimal Conditions: 1.4 Typical Conditions: < 4	<b>RMSE</b> { Optimal Conditions: 1.3 Typical Conditions: < 3
<b>R<sup>2</sup></b>	Optimal Conditions: 0.83 Typical Conditions: > 0.5	<b>R<sup>2</sup></b> { Optimal Conditions: 0.86 Typical Conditions: > 0.6
<b>RMSE</b>	Optimal Conditions: 3.8 Typical Conditions: < 8	<b>RMSE</b> { Optimal Conditions: 2.4 Typical Conditions: < 6

\* **About Performance Specifications:** Calculated from Clarity's dataset of > 6,000,000 measurements. **Optimal** refers to the 95th percentile of performance Clarity has observed under ideal or favorable conditions. **Typical** refers to common performance under various conditions. For more information on Clarity Node performance and why we don't cherry-pick performance results, [see our calibration explainer here](#).

**Additional Node-S Parameters:** PM<sub>2.5</sub> Number Concentration [# /cm<sup>3</sup>] | PM<sub>1</sub> Mass Concentration [µg/m<sup>3</sup>] | PM<sub>1</sub> Number Concentration [# /cm<sup>3</sup>] | PM<sub>10</sub> Mass Concentration [µg/m<sup>3</sup>] | PM<sub>10</sub> Number Concentration [# /cm<sup>3</sup>] | Internal Temperature [°C] | Internal Relative Humidity [%]

**Additional Parameters with Add-On Modules:** Wind Speed | Wind Direction | Ambient Temperature | Ambient Relative Humidity | Atmospheric Pressure | FEM-Grade Ozone Concentration | Black Carbon Concentration

## DATA FLOW

<b>Measurement Frequency (Adjustable)</b>	Default: Once every 15 minutes Minimum: Once every 3 minutes
<b>Data Retrieval from Cloud</b>	Clarity Dashboard (Web App) RESTful APIs (Programmatic Access) OpenMap (Public Data Sharing)
<b>Device to Cloud Communication</b>	Global cellular 2G/3G/4G SIM card and service included

## OPERATING CONDITIONS

<b>Weatherproof Rating</b>	IPX3
<b>Operating temperature<sup>4</sup></b>	-10° to 55° C
<b>Absolute temperature rating</b>	-40° to 70° C
<b>Operating humidity</b>	10% to 98% RH
<b>UV Exposure</b>	UV-resistant

## POWER<sup>2</sup>

<b>Current Consumption</b>	28 mA (sensing)   30 mA (transmission) <300 uA (sleeping)
<b>Input Voltage</b>	15 V
<b>Battery Capacity</b>	6400 mAh capacity   5-hour charge time 10.8 V nominal voltage
<b>Solar Panel</b>	6 W (max power)   21.6 V (open circuit voltage)   350 mA (short circuit current)
<b>Battery Life<sup>3</sup></b>	30 days (without solar power harvesting) >5 years (with solar power harvesting) <sup>3</sup>

## DIMENSIONS

<b>Node (no antenna, shield or solar panel)</b>	188 mm (W) x 98 mm (H) x 128 mm (D) Weight: 2.00 lb / 0.91 kg
<b>Solar Panel</b>	233 mm (W) x 176 mm (H) x 4 mm (D) Weight: 1.03 lb / 0.47 kg
<b>Solar Shield<sup>5</sup> (not including solar panel)</b>	232 mm (W) x 100 mm (H) x 162 mm (D) Weight: 0.60 lb / 0.27 kg
<b>Weight</b>	Total assembled: 3.64 lb / 1.65 kg

<sup>1</sup> Please note that our Global pre-calibration for NO2 can only be applied when temperatures are between 0 - 40° C.

<sup>2</sup> The Node-S can be used as a solar-powered or externally-powered device. External power required for operation below 0° C.

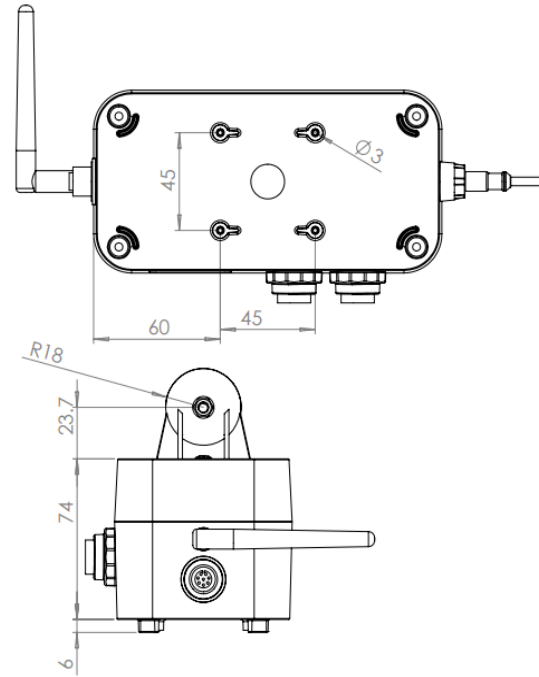
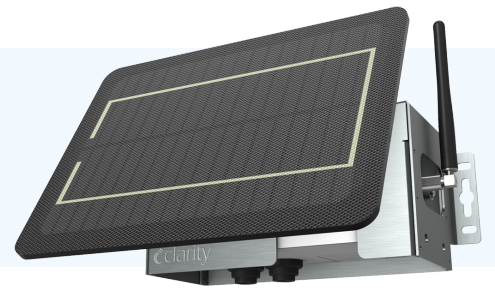
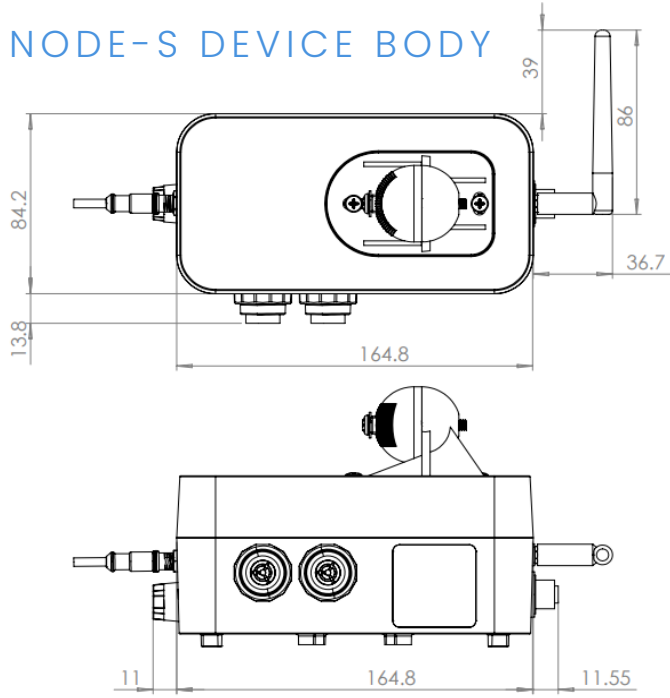
<sup>3</sup> Varies by deployment site location, solar panel orientation, and sampling frequency.

<sup>4</sup> Assuming default measurement frequency and exposure to an average of one hour of full sunlight per day over a 15-day rolling window.

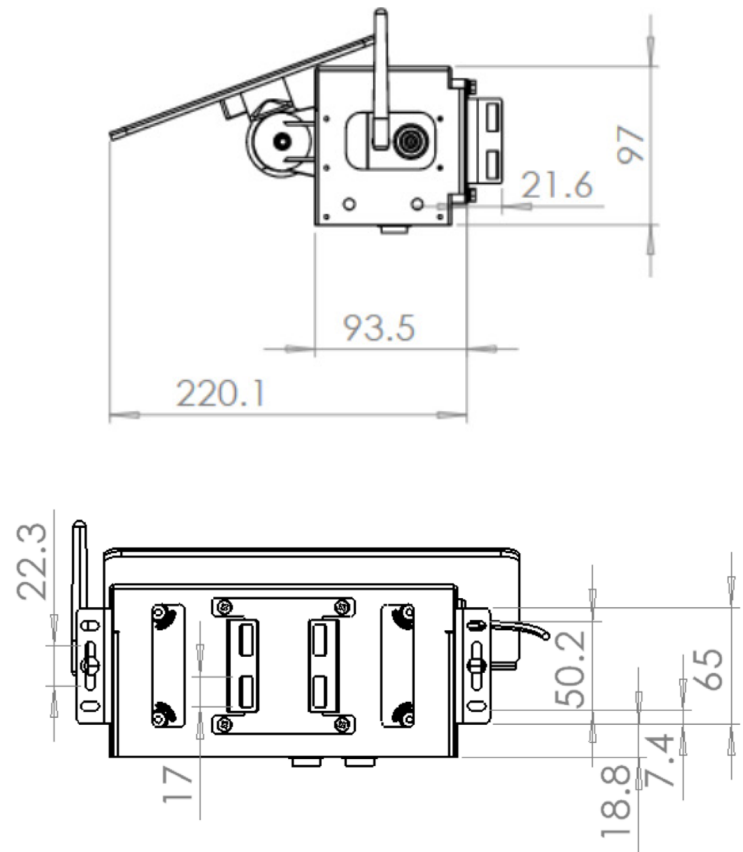
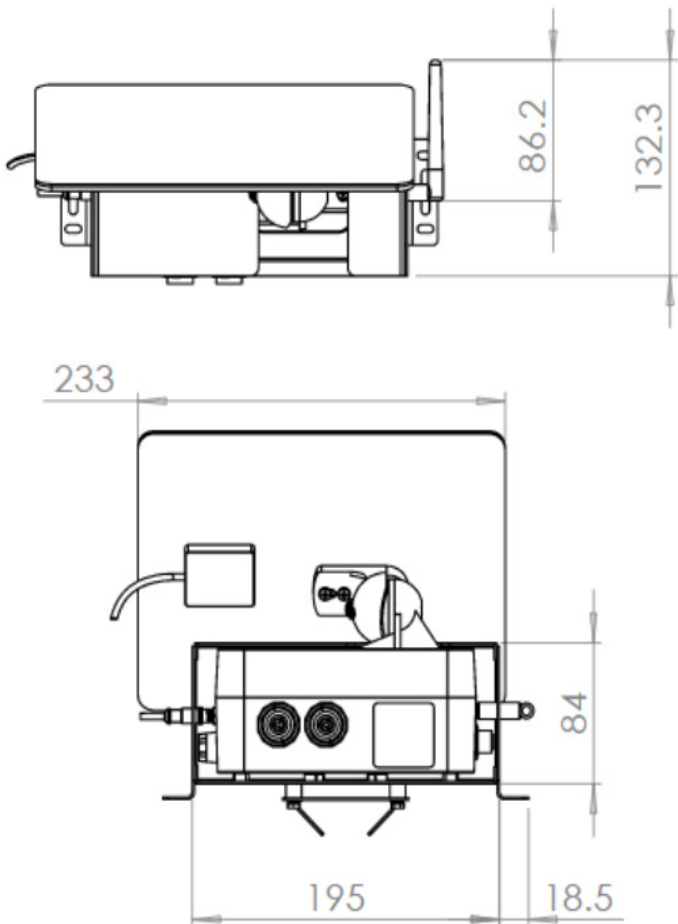
<sup>5</sup> Solar shield provides protection against direct heat radiation.

# Node-S Technical Drawings<sup>1</sup>

## NODE-S DEVICE BODY



## NODE-S DEVICE WITH SHIELD + SOLAR PANEL



<sup>1</sup> All indicated dimensions are in millimeters (mm)