

PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

Clarity Node-S with Dust Module

Manufactured by:

Clarity Movement Co.

808 Gilman Street
Berkeley
CA 94710
USA

has been assessed by CSA Group
and for the conditions stated on this certificate complies with:

**MCERTS Performance Standards for Indicative Ambient Particulate Monitors,
Environment Agency, August 2017, version 4**

Certified Performance Range*

PM_{2.5} : 0 - 125 µg/m³
PM₁₀ : 0 - 374 µg/m³

(*based on hourly average concentrations encountered during MCERTS field testing)

Project No.: 80302306
Certificate No: CSA MC260473/00
Initial Certification: 15 September 2026
This Certificate issued: 15 September 2026
Renewal Date: 14 September 2031



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*The MCERTS certificate consists of this document in its entirety.
For conditions of use, please consider all the information within.*

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Approved Site Application

Any potential user should make sure, in consultation with the manufacturer, that the monitoring system is suitable for the intended application. Further information is available from the Environment Agency's [Monitoring emissions to air, land and water \(MCERTS\) - GOV.UK](#) .

Indicative Ambient Particulate Monitors are field tested under MCERTS at typical ambient particulate concentrations. Therefore, the scope of certification is limited to the composition and magnitude that the sensors experience during field testing. Typically, this will be an “urban background” location. For further information refer to [MCERTS Bulletin PC 4](#).

The indicative dust monitoring analyser(s) can be operated in one of two ways:

For qualitative measurements: Providing qualitative measurement data for the analysis of particulate pollution trends, and source identification studies based for example on pollution roses etc. Such application can rely on instrument factory calibration only.

For quantitative measurements: Providing measurement data with the uncertainty defined for indicative instruments (+/- 50%). This can be achieved on condition that each instrument used for measurement has been calibrated on the specific site where monitoring is taking place against a standard reference method or an instrument method that is equivalent to a standard reference method for a period of two weeks and the resulting slope and intercept have been used for instrument calibration. To maintain the validity of data this calibration has to be repeated at least every twelve months or when the instrument is moved to a different site.

The Node-S with Dust Module monitoring system **cannot** be used on national automatic monitoring networks for compliance reporting against the Ambient Air Quality Directives.

This certificate is only applicable for the sampling frequency used during the certification testing. The sampling frequency for the Node S with Dust Module was 3 minutes.

The ‘Clarity Node-S with Dust Module’ field tests were carried out from the 10th October 2025 to the 18th January 2026 on two candidate systems, colocated with a Met One 1020 Smart Heated Beta Attenuation Monitors (BAMs) - the reference method. The location of the field test was Calexico, California, USA. The serial numbers of the two ‘Clarity Node-S with Dust Module’ systems were: Node-S ‘AJ4CJY3G’ and ‘AY94FXG7’ and Dust Module ‘MYH6Q9R7’ and ‘MXCMLQ7Q’.

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Field Test Conditions ('Clarity Node-S' systems connected to a Dust Module, Calexico, 2025-2026)

Parameter	Value
Test location	Calexico-Ethel Street, California, USA
Site type	Urban background
Particle characteristics	Elevated PMcoarse concentrations (PM coarse = PM ₁₀ - PM _{2.5}) were frequently observed during the field testing.
PM _{2.5} concentration range (hourly average)	0 to 125 µg/m ³
PM ₁₀ concentration range (hourly average)	0 to 374 µg/m ³
PM _{2.5} concentration range encountered (24-hour average)	2 to 56 µg/m ³
PM ₁₀ concentration range encountered (24-hour average)	4 to 203 µg/m ³
Temperature range	8 to 36°C
Relative humidity range	7 to 98%

Basis of Certification

This certification is based on the following test report(s) and on CSA Group's assessment and ongoing surveillance of the product and the manufacturing process:

Bureau Veritas, test report ref. AIR30632926, dated April 2026, "Test of the Clarity Node-S with Dust Module for use as an Indicative Monitor for PM₁₀ and PM_{2.5}"

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Product Certified

The 'Clarity Node-S with Dust Module' measuring system consists of the following components:

- Node-S base station, dimensions 188 (W) x 98 (H) x 128mm (D) includes Plantower PMS6003 particulate matter sensor, built in antenna, battery, cellular modem
- Solar Shield, dimensions (233mm (W) x 176mm (H) x 4mm (D))
- Solar Panel, dimensions (232mm (W) x 100mm (H) x 162mm (D))
- Dust Module 'CLA-DUST' optical light scattering detector able to detect changes in the particle size distribution and a dedicated heated inlet, dimensions 86 x 98 x 64mm, 0.98kg, IPX3 rated, UV resistant, solar powered via a 25W or 50W Clarity external power system

For the Node-S

Sensor type and firmware version

Plantower PMS6003, Firmware version 31 (0x1F)

Firmware and Algorithm Version of the system

Firmware Version 2.4.1.04, Algorithm Version 1.06403

For the Dust Module

Sensor type and firmware version

Clarity Dust Module model number "CLA-DUST", Firmware version 01

Both the Node-S and Dust Module units produce PM_{2.5} data. The Dust Module produces PM₁₀ data. Connection of the Dust Module to the Node-S automatically *suppresses* reporting of the PM₁₀ data associated with the Node-S.

This certificate applies to all instruments with firmware 2.4.1.01 onwards. The manufacturer recommends that the user should check the firmware version to confirm prior to instrument use.

The Clarity Node-S is available in PM-only and PM+NO₂ variants. Both variants use the same particulate matter sensor and monitoring system. No significant differences were identified during the certification testing between the two variants. Based on the certification test data, the additional NO₂ monitoring capability is not considered to affect performance of the certified PM_{2.5} and PM₁₀ measurements. Certification applies to PM_{2.5} and PM₁₀ measurements only.

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Certified Performance

Test (<i>Laboratory</i>)	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Constancy of the sample volumetric flow					Not applicable (note 1)	To remain constant within $\pm 3\%$
Tightness of the sampling system			0.00%			Leakage not to exceed 2% of sampled volume

Node-S (Firmware 2.4.1.04, Algorithm 1.0643, Global v2.1)

Test (<i>Field</i>)	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Intra-instrument uncertainty for the reference method PM _{2.5}					0.67µg/m ³	≤2.5µg/m ³
Intra-instrument uncertainty for the candidate method PM _{2.5} All data (slope corrected, n=91) ≥ 18 µg/m ³ (slope corrected, n=18) < 18 µg/m ³ (slope corrected, n=73)					0.23µg/m ³ 0.45µg/m ³ 0.13µg/m ³	≤5µg/m ³ for all data as well as for the subsets: < or ≥ 30 µg/m ³
Highest resulting uncertainty estimate comparison against data quality objective (Measurement Uncertainty) PM _{2.5} All data (slope corrected) (n=91) ≥ 18 µg/m ³ (slope corrected) (n=18)					20.7% 33.9%	$W_{CM} \leq 50\%$ $W_{CM} \leq W_{dpo}$ (W_{dpo} Measurement uncertainty defined as 50% for indicative instruments)
Maintenance Interval					min 2 years (note 2)	≥2 weeks

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Node S with Dust Module

Test (Field)	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Intra-instrument uncertainty for the reference method						
PM ₁₀					0.67µg/m ³	≤2.5µg/m ³
PM _{2.5}					0.67µg/m ³	≤2.5µg/m ³
Intra-instrument uncertainty for the candidate method						
PM ₁₀						
All data (slope corrected, n=91)					1.96µg/m ³	≤5µg/m ³ for all data as well as for the subsets:
≥ 30 µg/m ³ (slope corrected, n=30)					1.91µg/m ³	< or ≥ 30 µg/m ³
< 30 µg/m ³ (slope corrected, n=61)					2.15µg/m ³	
PM _{2.5}						
All data (slope corrected, n=91)					0.72µg/m ³	≤5µg/m ³ for all data as well as for the subsets:
≥ 18 µg/m ³ (slope corrected, n=18)					0.97µg/m ³	< or ≥ 30 µg/m ³
< 18 µg/m ³ (slope corrected, n=73)					0.48µg/m ³	
Highest resulting uncertainty estimate comparison against data quality objective (Measurement Uncertainty)						
PM ₁₀						W _{CM} ≤50%
All data (slope corrected) (n=91)						W _{CM} ≤ W _{dpo}
≥ 30 µg/m ³ (slope corrected) (n=61)					38.0%	(W _{dpo} Measurement uncertainty defined as 50% for indicative instruments)
					40.0%	
PM _{2.5}						
All data (slope corrected) (n=91)					13.1%	
≥ 18 µg/m ³ (slope corrected) (n=18)					22.9%	
Maintenance Interval					Min 2 years (note 2)	≥2 weeks

Note 1 - Clarity Node-S with Dust Module utilise a fan and not a pump, therefore it was agreed that this test was not applicable.

Note 2 - Maintenance - the manufacturer states that no routine maintenance is required in the field. The system raises an alarm when the Node-S with Dust Module system operational status has degraded. Users are instructed to carry out the trouble-shooting, should this be unsuccessful, the Node-S with Dust Module system should be replaced.

Note 3 - For the system to be used for indicative purposes the Clarity Node-S with Dust Module must be set up using the configuration, as follows; i) Node-S: Plantower PMS6003 sensor type with firmware version 31 (0x1F). Dust Module: CLA-DUST sensor type with firmware version 01, ii) Firmware and Algorithm version of Sensor System: Firmware version 2.4.1.04, algorithm 1.06403, iii) the Node-S PM_{2.5} correction methodology is referred to by Clarity as "Global v2.1" (CATFZKB7G4); alternatively, a site-specific calibration can be applied using the manufacturer's recommended procedure, and iv) the Dust Module PM₁₀ using its factory calibration; alternatively, a site-specific calibration can be applied using the manufacturer's recommended procedure.

Note 4 - When the Dust Module is connected to the Node-S, Clarity's data system reports PM_{2.5} measured by the Node-S and PM₁₀ measured by the Dust Module.

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Description

The Clarity Node-S is an air quality sensor. The Node-S comes with solar power and global cellular connectivity.

The Node-S device samples the air, measurements are uploaded to the Clarity Cloud via cellular networks. This cloud architecture handles all aspects of air quality data transmission, validation, storage, and processing. Access of the raw and calibrated data can be done through the Clarity Dashboard and APIs.

The Clarity Dust Module is an optional module that connects to the Node-S. It measures coarse particulate matter (PM₁₀) by optical light scattering, detecting changes in the particle size distribution with a dedicated heated inlet. When connected, the Dust Module's measurements are uploaded to the Clarity Cloud through the Node-S and are accessed in the same way as the Node-S data.

General Notes

1. This certificate is based upon the equipment tested. The Manufacturer is responsible for ensuring that on-going production complies with the standard(s) and performance criteria defined in this certificate. The manufacturer is required to maintain an approved quality management system controlling the manufacture of the certified product. Both the product and the quality management system shall be subject to regular surveillance according to 'Regulations Applicable to the Holders of CSA Group Testing UK Ltd Certificates'.
2. The design of the product certified is defined in the CSA Group design schedule V for certificate No. CSA MC260473.
3. If a certified product is found not to comply, CSA Group should be notified immediately at the address shown on this certificate.
4. The certification marks that can be applied to the product or used in publicity material are defined in 'Regulations Applicable to the Holders of CSA Group Testing UK Ltd Certificates'.
5. This document remains the property of CSA Group and shall be returned when requested by CSA Group.

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