TOBIN

Rooaunalaghta Green Energy Project

Appendix 12-4

Lidar Installation Report

ROOAUNALAGHTA
Green Energy

BUILT ON KNOWLEDGE

GALETECH
Measurement Services

Project: **Rooaunalaghta Wind Farm – LIDAR Installation Report**

Client: **Greensource Sustainable Developments Ltd**

Clondargan, Stradone, Co Cavan H12 NV06
+353 555 5050
www.galetechmeasurementservices.ie

Playing our Part In The Sustainable Energy Transition.

Document Control

Responsible for	Function	Name	Date	Signature
Content	Project Manager	Gary Fannin	13/11/2024	GF
Checked	Technical Services Manager	Cormac McPhillips	13/11/2024	CMP
Approved	General Manager	Kieran Elliott	13/11/2024	KE
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#	Function Title	Company	Name (optional)
1	Project File	GMS	
2	Client	Greensource Sustainable Developments Ltd	
3			
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LIDAR Unit Details	
Customer	Greensource Sustainable Developments Ltd
Deployed by	Fergal McConnel & Enda Collins – Galetech Measurement Services Ltd
LIDAR installation date	11.11.2024
LIDAR ID number	ZX1420
Unit Orientation Checks	
Bearing (Compass)	Aligned to ITM Grid North using a submeter GPS
Met station marker and correctly aligned	✓
Unit Level (Spirit Level)	✓
External System Checks	
Mains or off grid power	Off Grid
Power Solution	Methanol/Solar Hybrid Power Supply 4 x 400-Watt Solar Panels (Power supply has GSM solution to allow remote access)
Battery bank size	4 x 130Ah
Battery bank voltage	24V
Generator hours	N/A
Fuel Supply/ Fuel Level	Full 4 x 28ltr Methanol Containers
PV Cleaned	✓
Generator voltage >11.2V	✓
External Unit Checks	
Observation	None
No damage or trapped cables	✓
Clear Optics	✓
System check lights, Modem light flashing green after 2 minutes	✓
Screen wash/Protection	Yes /-20‘C protection
Amount of fluid in washer bottle	Full
ZX configured to wipe when rain sensor is triggered	✓

Force wash wipe tested	✓
LIDAR Check	
Version of Waltz used to test	Version 6.2
Status lights green	✓
Check lens height	1.0 m
Met Station Checks	
Tilt Value (degrees)	0 Degrees
Met station wind direction changing	✓
Met station wind speed changing	✓
Met Pressure (Pa)	1036.10
Ambient temperature (C)	2.34 Degrees
GPS Coordinates	53.50164, -9.14926
Elevation at ground level at the lidar position	50.1m
Communication Checks	
Modem/aerial (Connection Test)	✓
Internet available flag	✓
Email on power on	✓
System Checks	
ZX Firmware version	3.3002 ZX300
ZX Serial Number	ZX1420
Clear wind data using Waltz	N/A
Input Voltage (v)	12.28
Super Capacitor Voltage (v)	N/A
Check Pod Humidity	32%
Pod temperatures	Upper. 30 degrees
	Lower. 31 degrees

Final Checks					
Actual Measurement Heights			150	100	82
(Including Height of Lidar Window)	80	65	39	15	11
Time	ZephIR Time 11/11/2024 12:20:00 GMT+0				
	Local Time 11/11/2024 12:20:00 GMT+0				
Log off WIFI connection before leaving	✓				
Other Notes					

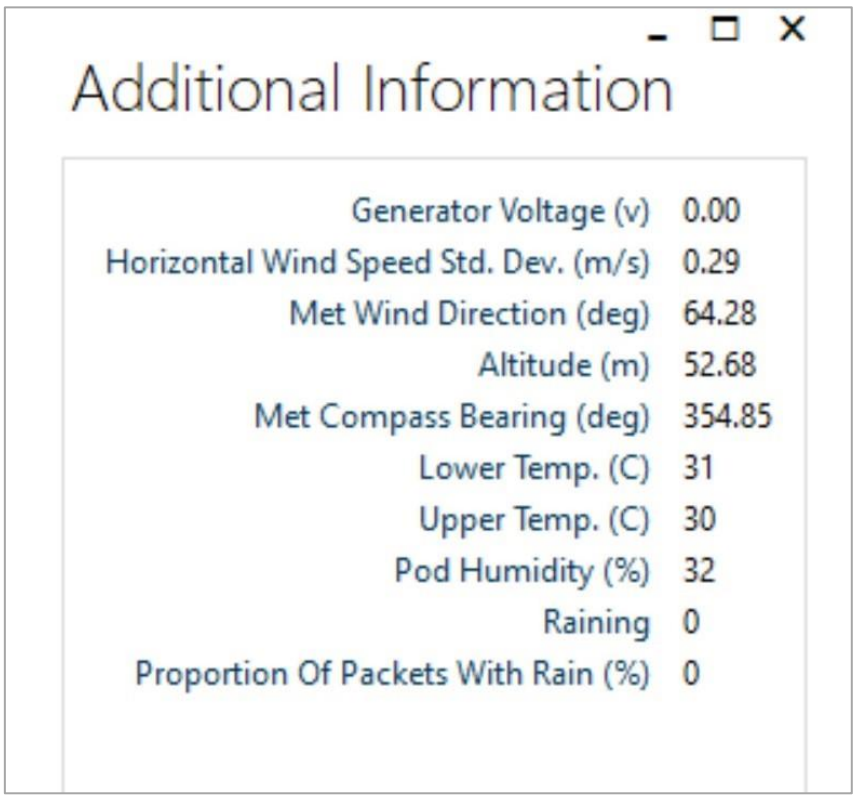


Figure 1 – Additional information regarding the LIDAR unit.

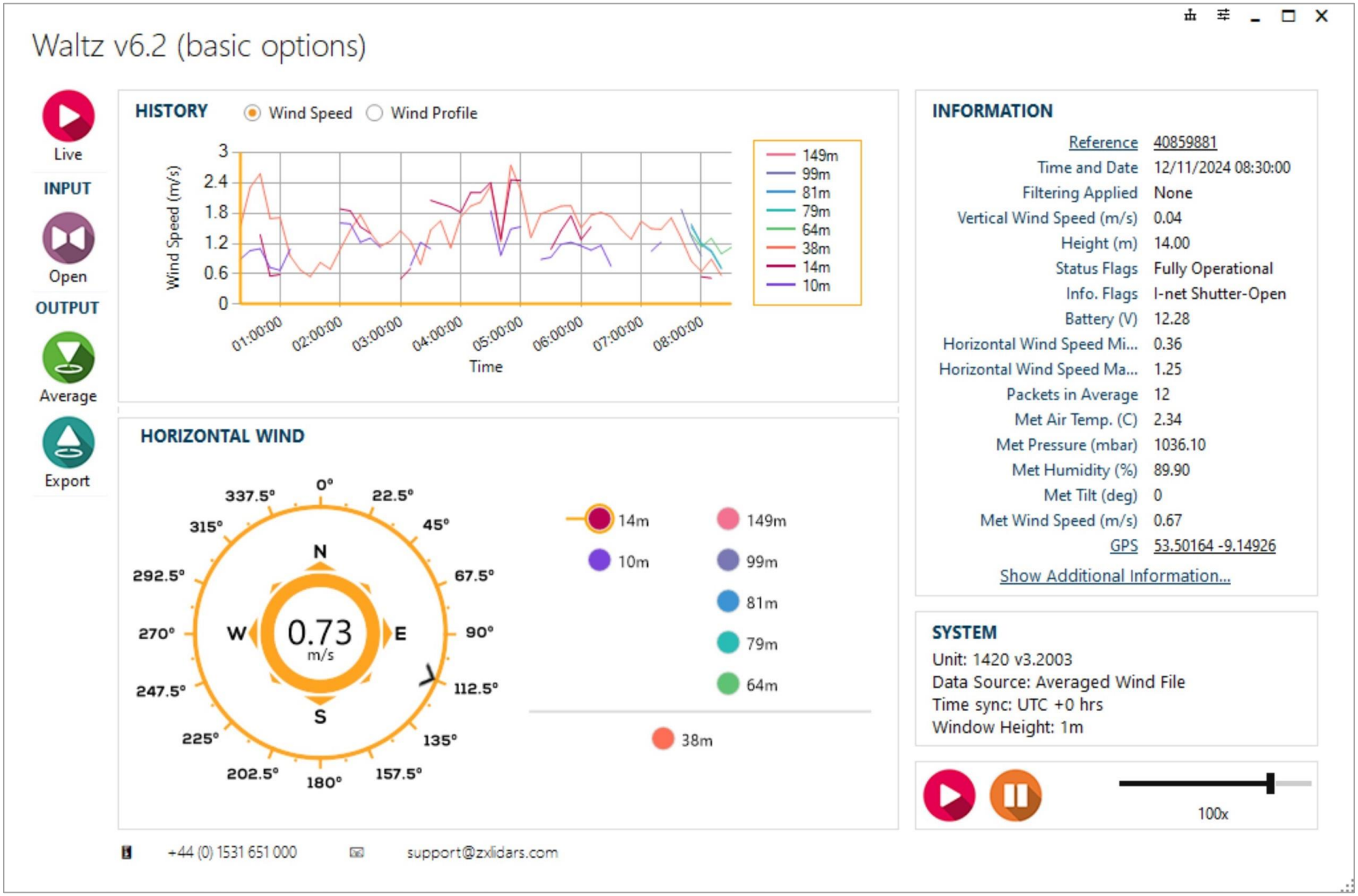


Figure 2 - Image of initial measurements of the LIDAR unit.

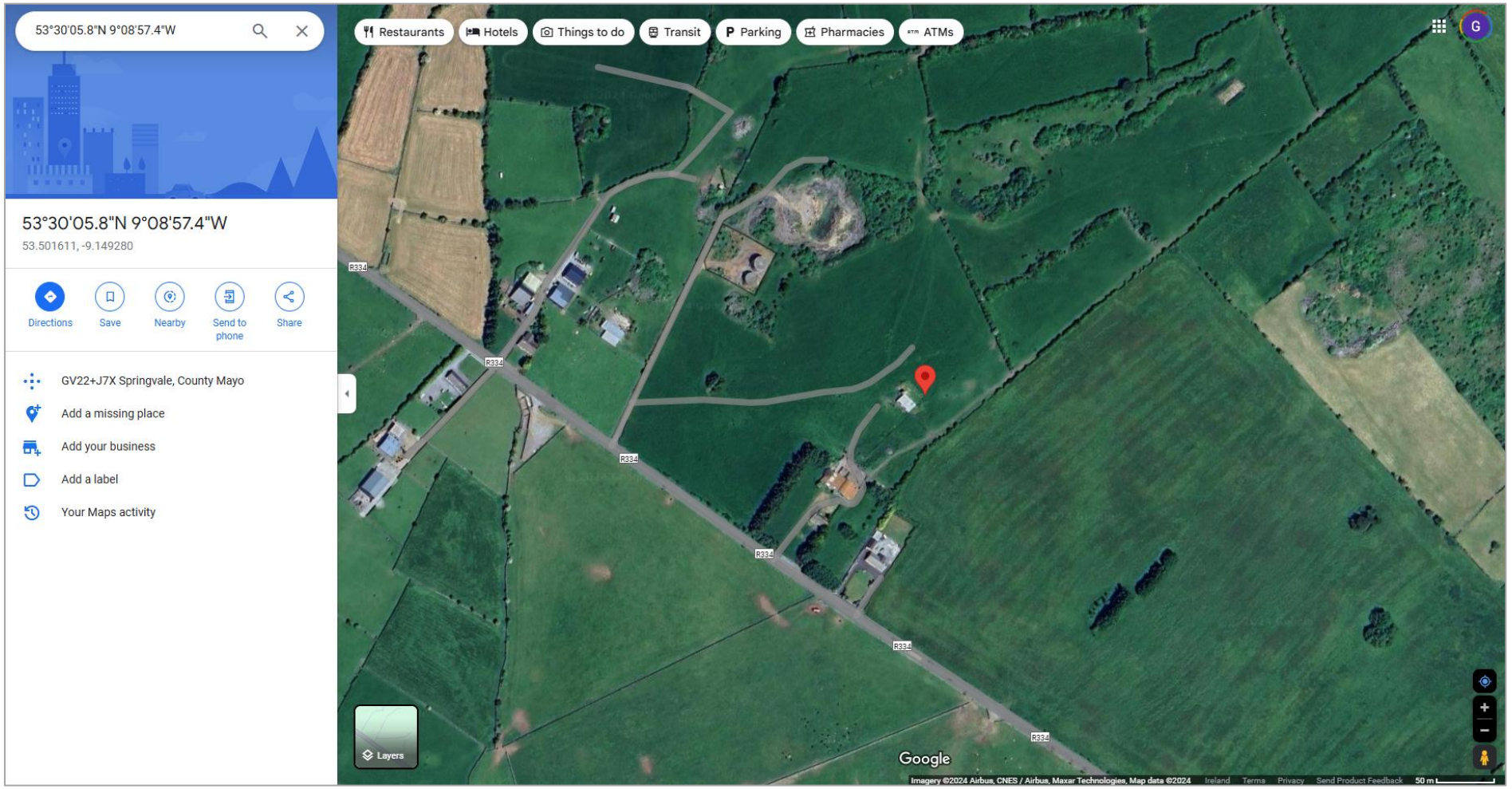


Figure 3 – LIDAR unit GPS Location

Installation Photographs

Figure 4 – Lidar Overview

Installation Photographs

Figure 5 – Lidar Overview

Installation Photographs

Figure 6 – Image of LIDAR bubble level 1

Installation Photographs

Figure 7 – Image of LIDAR bubble level 2

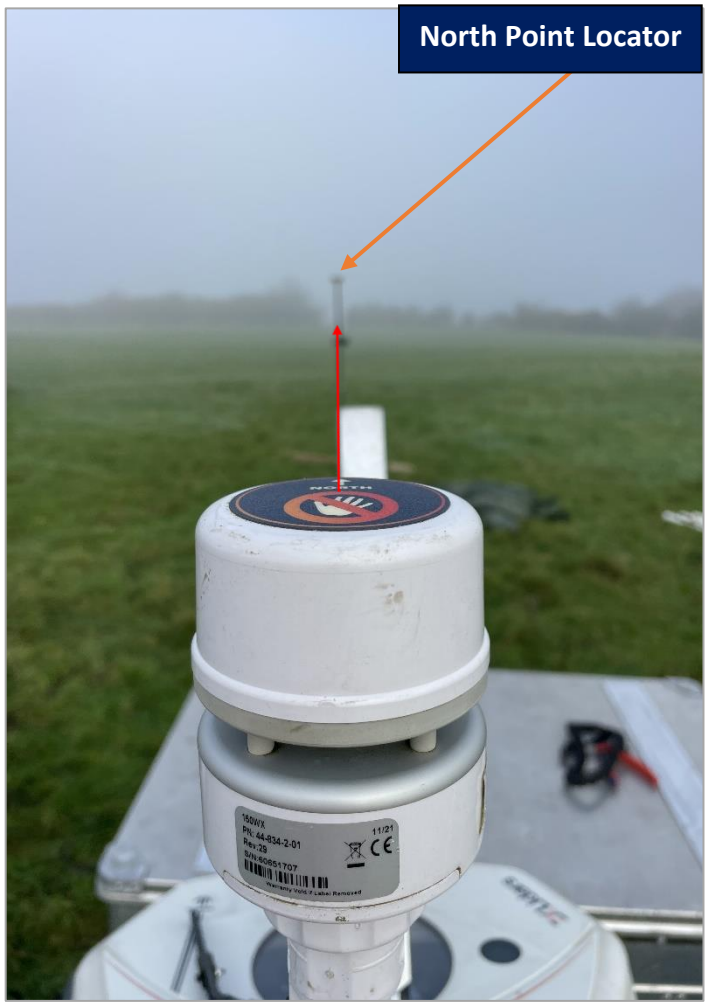


Figure 8 - LIDAR Orientation Photograph

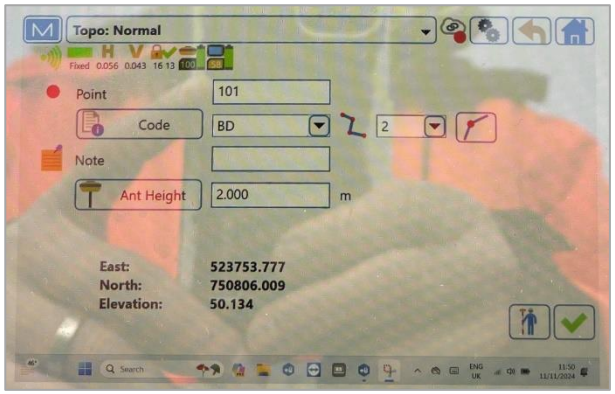


Figure 9 - GPS Coordinate at North Point Locator (ITM)

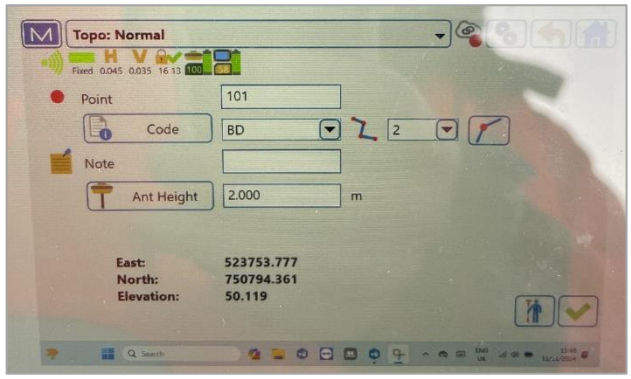


Figure 10 – GPS Coordinate at Lidar Location (ITM)



Figure 11 - Photographs of the area surrounding the LIDAR Position



Appendix A

ZX LIDARS FACTORY ACCEPTANCE CERTIFICATE

System Variant:	ZX300
Serial Number:	ZX1420
Certificate Date:	03-05-2022
Test station:	Zephir Limited, The Old Barns , Fairoaks Farm, Hollybush, Ledbury, HR8 1EU, UK

FACTORY CALIBRATIONS AND PERFORMANCE VERIFICATION TESTS:

Velocity testing and system integrity tests provide a check of the performance of the lidar:

Test:	*Criteria:*	*Result:*
VELOCITY TEST*	**VELOCITY ERROR < 0.5%**	**PASS**
DIRECTION CALIBRATION*	**DIRECTION ERROR < 0.5°**	**PASS**
SENSITIVITY TEST*	**BACKSCATTER RATIO > 1.0**	**PASS**
FOCUS CALIBRATION**	**RANGE ERROR < 1m**	**PASS**

***Velocity, Direction, and Sensitivity checked against calibrated moving belt at speeds up to 5m/s**
****Focus calibrated at 80m focus range**

Additional factory functionality tests and checks carried out:

Power supply performance and safe	✓	Ingress protection and enclosure sealing	✓
Met station configuration	✓	Environmental control operation	✓
Window cleaning system	✓	Operating system configuration and checks	✓
Optical functionality	✓	External cable and connector integrity	✓
Rain sensor	✓	Mechanical level functionality	✓
Modem and communications	✓	Internal humidity	✓
Data collection and export	✓		

This certificate warrants that the lidar unit detailed above has passed all relevant factory acceptance tests.

The performance of identical build level lidar units (which have passed the same factory assessment tests) have been verified against an IEC compliant meteorological mast with calibrated cup anemometry.

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Authorised signatures:

Name:	**Gary Ellis**	**Dr. Andy Lewis**
Title:	**Senior Engineer**	**Quality Manager & Engineering Project Manager**
Signature:		
Date:	03-05-2022	03-05-2022