The way to measure wind

ZX Lidars

Wind speed at light speed

We are ZX Lidars

The way to measure wind

The safer, faster, better, cheaper way to measure wind. Operate in all climates including clean air, reduce wind measurement uncertainty and increase project and design value.

Manage your wind resource risk and optimise your assets by employing the original and single most validated wind industry Lidar available.

ZX Lidars are powerful tools in any wind measurement toolbox: in wind farm development, site construction, through to site and project operations, and in other applications where wind measurements are key.

Our product family - ZX 300, ZX 300M and ZX TM – allows for accurate, accepted and affordable wind measurements onshore, offshore, and from existing structures such as wind turbines.

The ZX Customer Care Charter is our promise to support you throughout your Lidar ownership. Technical queries responded to within 24 hours, remote Lidar diagnostics, regular Care check-ins, and when you do need support on site, our ZX Trusted Technicians will be right there.

Our Team Values

Respect. This is the cornerstone in all we do. Respect for our environment, our customers, our partners, our company and most importantly ourselves and each other.

Sincerity. We want our customers to love what we do as much as we do. We do our best to make sure that we understand our customers and our customers understand us.

Enthusiasm. We love science, technology and market development – and making it all mean something for the benefit of our customers and of our team.

Sustainability. Planet, people and company. Without a planet we have no people. Without people we have no company. We must act in a sustainable way in all that we do and reduce our consumption, waste and footprint.

Emotional Intelligence. When innovation is at the heart of what you do, emotional intelligence comes hand in hand. We aim to work in the smartest of ways, always.

Ian Locker

Ian Locker
Managing Director &
Founder of ZX Lidars

Why Lidar

Safer

According to an independent study by Renewable Energy Systems (RES), substituting masts with Remote Sensing Devices, such as Lidars, leads to fewer accidents and near misses. Additionally Working at Height is limited.

There is now a documented lower chance of an accident or safety incident comparing the use of Remote Sensing Devices to met mast campaigns.

Faster

No planning application for tall structures is required and mobilisation of Lidars can be achieved in just a matter of hours.

Nacelle-based Lidars can be installed and removed rapidly for operational wind measurements.

Cheaper

Increasing turbine hub heights and rotor diameters demand representative wind measurements. Lidars are more cost effective for higher hub heights relative to met masts.

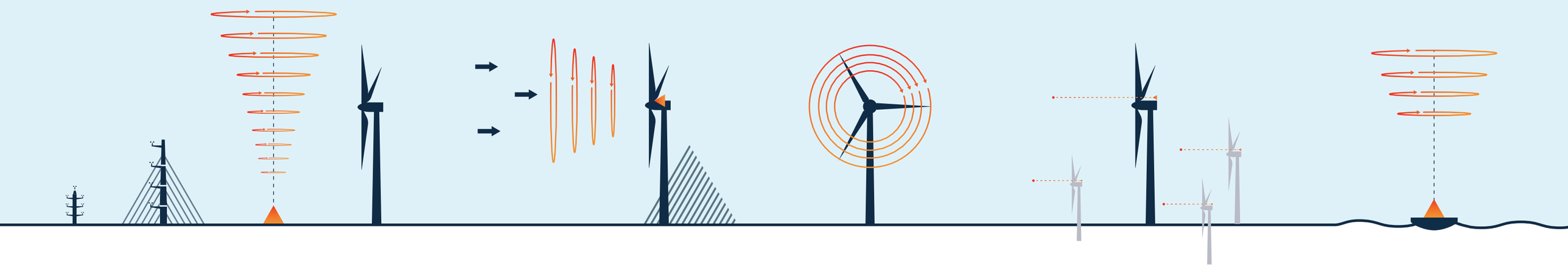
Through-life costs of Lidar are lower with minimal servicing, validation or calibration required.

In operation, coverage across the whole wind farm can be achieved with nacelle-based Lidars.

Better

Lidar measurements can be taken across the whole turbine rotor reducing project uncertainty and validating turbine performance. Lidars are mobile and measurements can be taken across large sites.

Layouts can be optimised, operations can be tailored.



Onshore **On turbines** **Across wind farms** **And Offshore**

The originators and innovators of todays wind Lidar industry and community

Our team of pioneering innovators and experts, our ZX family, are helping drive the transition to renewable energy globally. Our ground-breaking products have changed the way wind is measured, and in doing so accelerated the development of wind projects around the world.

We are proud of all and every member of our company, who continue to challenge and change the way the world is using wind data and are actively contributing to creating a greener world and mitigating climate change.

Together, we are responsible for:

- Europe's largest dedicated wind Lidar facility
- Operating the UK Remote Sensing Test Site
- A 'product-first' business, ZX Lidars
- A 'service-first' business, ZX Measurement Services
- 15,000+ system deployments in more than 100 countries globally

We are disruptive, we are change, we are a future.

ZX 300

Accurate, reliable and fast onshore wind measurements from vertical profiling Lidar.

Accepted by DNV as a Stage 3 Bankable Lidar in simple terrain and by Deutsche WindGuard in complex terrain. Full IEC Classification, the single largest body of evidence of met mast / Lidar validations at the UK Remote Sensing Test Site and gold-standard ‘highest height’ validations at 213m and 244m.

ZX 300 at a glance:

- Remotely measure the wind from 10 to 300 metres above ground.
- Reduce your measurement uncertainty by measuring higher than a met mast and by mobilising measurements across a whole site.
- Better manage health & safety requirements on site with no need to work at height.
- Be flexible within your planning applications by using a low visual impact, low height device.
- Start your measurement campaign tomorrow with little or no site preparation or planning permits required.
- ZX 300 is fully IEC Classified to IEC 61400-12-1: 2017.

The most validated ground-based wind Lidar in the world, and to the highest heights

A sophisticated, rugged system, highly reliable, designed and built to perform in real world deployments, clean air and extreme environments.

Absolute accuracy demonstrated through wind tunnel testing.

Accepted by all leading wind consultants for energy assessments and site prospecting including DNV Stage 3 approved finance-grade data in benign terrain, and Deutsche WindGuard approved CFD conversions for finance-grade data in complex terrain.

Low cost of ownership with no requirement for annual servicing or calibration within a 5 year period.

ZX 300 is the mid-life upgrade of our established ZephIR 300 wind Lidar. Features include:

- Modernised internal components. These benefits are realised through increased in-field performance and long-term serviceability. ZX 300 is provided as standard with an extensive 60 month return-to-base warranty – the longest of any Lidar.
- Refreshed User Interface. Additional contrast modes and streamlined menu systems promote easier navigation when deploying and configuring ZX 300.
- Performance Verification through our rigorous and audited Factory Acceptance Test as standard.
- Real-time Quality Controlled 1-second data. This new best-in-class resolution of wind data enables emerging Lidar applications within the wind, meteorological and associated industries such as crane lifts and helicopter operations. No other Lidar provides a full 360° wind field calculation derived from just one second of data.

In addition, ZX 300 features optimised processing for improved wind data quality control. Extensive field demonstrations have been performed on ZX 300 at the UK Remote Sensing Test Site. The analysis of these deployments spanning several years over all seasons and weather conditions delivers results showing excellent performance and a step forward in the existing accuracy that is considered Stage 3, suitable for standalone wind energy assessments, by DNV. ZX 300 is fully IEC Classified to IEC 61400-12-1: 2017.

Take confidence from our extensive 5 year ZX Care Warranty

ZX300 Specification

Measurements

Range	10 - 300 metres (Lidar measurement) 0 - 10 metres (onboard met weather station)
Probe length	± 0.07 metres @ 10 metres ± 7.70 metres @ 100 metres
Heights measured	10 User configurable 1 Additional met weather station measurement
Sampling rate	50Hz (up to 50 measurement points every second)
Averaging rate	True 1-second averaging 10-minute averaging
Accuracy wind speed	0.1 m/s*
Direction variation	< 0.5°
Speed Range	< 1 m/s to 80 m/s
Data storage	3Gb

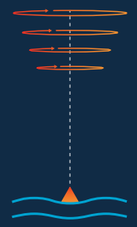
Product

Service interval	5 years from new
Size	900 x 900 x 1001mm
Weight	55kg
IP Rating	IP 67
Power consumption	55W
Power input	12V
Temperature range	-40 + 50°C
Warranty	Up to 5 years
Maintenance	No annual maintenance or calibration in this period
Laser	Class 1, Eye Safety (IEC 60825-1)

* as measured against calibrated moving target

The faster way to measure wind.

ZX300



ZX 300M

Accurate and robust offshore wind measurements from vertical profiling Lidar

Integrated on all major commercial Floating Lidar Devices (FLDs) and designed for any offshore platform. Unmatched track-record in the harshest of offshore floating environments. All with the longest service and warranty period, as standard, of any Lidar. Full IEC Classification, the single largest body of evidence of met mast / Lidar validations at the UK Remote Sensing Test Site and gold-standard 'highest height' validations at 213m and 244m.

ZX 300M at a glance:

- 10 to 300 metre wind measurements from deck.
- Specifically designed for the offshore environment with enhanced marinisation.
- Extensive 3 year service period ensuring the lowest cost of ownership of any offshore Lidar available.
- Installed and proven for use on all market-ready floating Lidar platforms.
- Validated across multiple pre-commercial floating deployments and as mast replacements on fixed platforms.
- Collaborative agreements with leading Floating Lidar Device manufacturers for effective Turbulence measurements.
- ZX 300M is fully IEC Classified to IEC 61400-12-1: 2017.

Responsible for more than 90% of all new offshore wind measurements globally

Use the industry standard offshore Lidar for the most certain outcome.

Significantly reduce the cost of your measurement campaign offshore.

Reduce your measurement uncertainty by measuring higher than a met mast.

Reduce your measurement uncertainty further by mobilising measurements across a whole site by utilising Floating Lidar Devices.

Better manage health & safety requirements on site with no need to work at height.

ZX 300M features include:

- Our Continuous Wave laser measures the Line of Sight wind speed every 20 milliseconds to 'freeze' any motion encountered.
- Multi-layered, highly insulated, plastic moulded Lidar housing, with additives to provide high UV stability and improved marine growth resistance.
- Highest grade of marine connectors available for all peripheral items, 2000+hrs salt spray tested.
- Custom stainless steel frame to allow for ease of handling and efficient securing to any platform surface.
- Marine met station with improved yaw determination, for floating offshore platforms.
- Stainless steel window wiper system with silicone wiper blade.
- All External components tested to IEC60068-2-11.

ZX 300M Specification

Measurements

Range	10 - 300 metres (Lidar measurement) 0 - 10 metres (onboard met weather station)
Probe length	± 0.07 metres @ 10 metres ± 7.70 metres @ 100 metres
Heights measured	10 User configurable 1 Additional met weather station measurement
Sampling rate	50Hz (up to 50 measurement points every second)
Averaging rate	True 1-second averaging 10-minute averaging
Accuracy wind speed	0.1 m/s*
Direction variation	< 0.5°
Range	< 1 m/s to 80 m/s

Product

Service interval	36 months from new
Size	805 x 845 x 966mm
Weight	53.4kg
IP Rating	IP 68
Power consumption	55W
Power input	12V
Temperature range	-40 + 50°C
Warranty	3 years
Maintenance	No annual maintenance or calibration in this period
Laser	Class 1, Eye Safety (IEC 60825-1)

* as measured against calibrated moving target

The reliable way to measure wind.

ZX300M

The nacelle-mounted Lidar for wind turbine Power Performance Measurements

Power Performance Measurements from the only Lidar that measures the full shear and veer wind profile of a wind turbine. Approved by leading OEMs for Power Performance Testing. Operates in all environmental conditions including clean air with market-leading Lidar sensitivity. Holistic wind data to explore future Lidar Assisted Control strategies.

ZX TM at a glance:

- IEC 61400-50-3 compliant power performance measurements to understand turbine performance in relation to OEM's power curve.
- Remotely measure the wind speed and direction at hub height, 550m ahead of a wind turbine.
- Uniquely measure the full shear and veer wind profile up to 300m ahead of a wind turbine.
- Benchmarking of specific turbine model performance to understand the product performance under both warranted and non-warranted conditions.
- Standard industry-accepted methodologies and measurements for: Power Curves, Nacelle Transfer Function calibration, including Yaw Alignment, and Wake Detection.
- Extensive 3 year service period ensuring the lowest cost of through-life ownership.
- Suitable for installation on all major turbine platforms.
- Approved by Siemens Gamesa Renewable Energy, GE Renewable Energy and other leading OEMs for Power Performance Testing including OEM-approved installation brackets.

Accurate power performance tests and detailed, operational power curve assessments

Execute Power Performance Measurements and Testing to IEC standards including IEC 61400-50-3:2022 within your Turbine Supply Agreement with Nacelle Based Lidar.

Monitor Operational Power Performance including yaw alignment, turbine degradation, and upgrade path verifications within inner and outer ranges (warranty and out of warranty conditions).

Assess the available wind resource post construction for accurate energy and load assessments for budget and life-time calculations, site repowering and wind driven grid-scheduling.

ZX TM features include:

- 17 Horizontal measurement ranges and up to 15 vertical slices at each range – the most comprehensive measurement capability of any Lidar, delivering Rotor Equivalent Wind Speed and slices for IEC Power Curves.
- High Lidar directional positional accuracy on turbine essential for any set point changes relative to rotor alignment using unique patented auto-alignment technique in addition to roll / inclination sensors on board.
- Extensive 3 year service life as standard.
- High availability with all laser energy focused at each measurement range, with low susceptibility to turbine blades due to short measurement integration time (50Hz).
- “Application mode” software helping you to define Key Performance Indicators, campaign duration and to include turbine parameters, in addition to the initial installation and easy configuration of the Lidar.

ZXTM Specification

Measurements

Configurations	3” Lidar optical head, 15 or 30 degree half-angle scan 17 horizontal ranges with configurable dwell times 15 vertical slices at each range across the rotor disk
Wind characteristics	Wind speed, shear, veer, wind yaw misalignment, turbulence, rotor equivalent wind speed (REWS), windlflow complexity
Scan & Data sample rate	Full rotor scan for REWS measurement up to 300m ahead 50Hz / 20ms measurements
Speed range	0.5 - 45 m/s (wind loading survivability up to 70 m/s)
Accuracy	Wind speed, 0.1 m/s Wind direction, 0.5°
Measurement range	10m - 550m

Product

Weight	Lidar Optical Head (LOH): 20 kg Lidar Control Unit (LCU): 29 kg Turbine Integration Kit (TIK): 35kg
Size	LOH: 356 x 285 x 823 mm LCU: 209 x 513 x 630 mm Cable length: 10 m (or 15m option)
IP Rating	LOH: IP 66 LCU: IP 65 Marine atmosphere compliant (IEC 60068-2-52) Operating humidity 0 to 100% RH
Ambient temperature range	LOH: -30 to 50˚C LCU: -40 to 60˚C
Warranty / Maintenance	3 year warranty as standard No factory maintenance or calibration required during 3 year service period
AC Power	Nominal: 96 W Hot / cold conditions: Up to 275 W Maximum rating: 400 W
Compliance	Class 1 Eye Safe Infrared Laser, IEC60825-1
Mounting	Wind turbine nacelle, platform or ground mounted

Access

User Interface	Web-based interface via laptop, mobile or tablet
Data Interfaces	Ethernet via M12 to RJ45 (adaptor cable) WLAN 802.11 a, b, g, n, d Cellular POE Modem (Optional)
Comms protocols	Web based GUI for configuration, measurements and status monitoring Modbus (TCP) Web API Local Data Broadcast (UDP) File transfer protocol (FTP) Push and Pull
Data storage	24 months
Timestamp	GPS (with optional local time offset) or NTP

Compliance

CE	2014/35/EU (Low Voltage), 2014/30/EU (EMC), 2014/53/EU (Radio Equipment), 2011/65/EU (ROHS)
EMC	IEC 61010-1 (Safety), 61000-6-2 (Immunity), 61000-6-4 (Emissions)
Laser	BS EN 80625-1:2014 Class 1

The accurate way to measure wind.

ZX Measurement Services

Our experienced team is a global leader in the design, installation and turnkey management of wind measurement systems including Lidars, meteorological masts and Sodars, and all necessary power and communication ancillaries.

At ZX Measurement Services we ensure all measurement campaigns are designed and delivered to exactly meet our customers needs to provide comprehensive data sets to the highest industry standards.

Wind Data as a Service

We provide the following extensive field and back office support services:

- Lidar and Sodar rental onshore.
- Nacelle-mounted Lidar for wind turbines for power performance verification or Power Plant Optimisation (Power Quality Monitoring, yaw error correction and wake mitigation).
- Met Masts and Solar Monitoring.
- Bespoke Noise Monitoring packages.
- Measurement campaign design and optimisation including system security and communications.
- Field Services including system installation, management, operation and decommissioning.
- Power supply design, build, installation, management, rental and sales.
- Lidar and Sodar fleet management.
- Customer training and technical support.
- Data management, analysis and reporting.

Our promise to our customers is simple. Excellence in measurements and project data.

Combining ZX Lidars' position as industry leaders in the development and supply of Lidars globally with our experience in the design, application and management of turnkey measurement campaigns offers the unique opportunity for Project Developers, Asset Managers and Owner / Operators to maximise data quality and availability whilst minimising measurement uncertainty and cost.

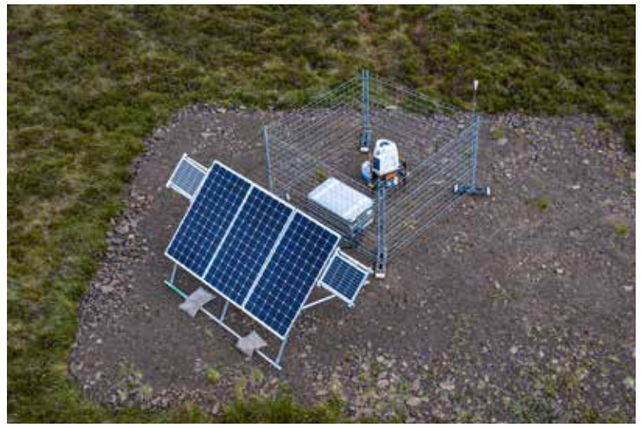
Our customer's objectives become our own objectives

The availability of high quality data has always been the cornerstone of any energy project. Whether it is wind resource data for the purpose of project development, operational data used in the optimisation of existing power plant or power performance data used in the verification and acceptance testing of existing or newly installed individual turbines. The need for low cost, accurate and reliable measurements has never been more important.

At ZX Measurement Services, our primary focus is the acquisition of the highest quality data with the lowest measurement uncertainty. Our team has over 70 years combined experience in the design, installation and management of measurement systems, ensuring all measurement campaigns are designed and delivered to exactly meet our customers needs whilst optimising new and existing technologies to provide comprehensive data sets.

We only use the best wind monitoring sensors and we supply robust methanol fuel cell based modular remote power supplies, designed and proven to operate in the harshest of environments, all to ensure maximum data availability.

Our focus is always ensuring that projects have the data necessary to succeed.

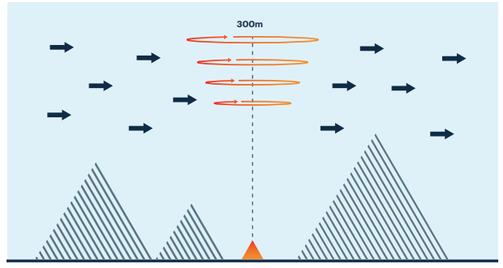


The easier way to measure wind.

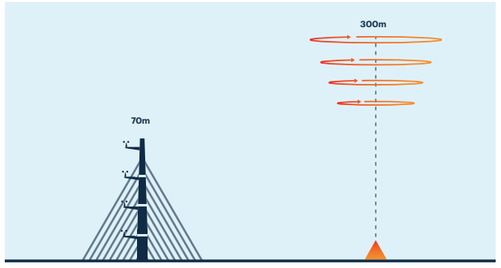
ZX Measurement Services

Use Cases

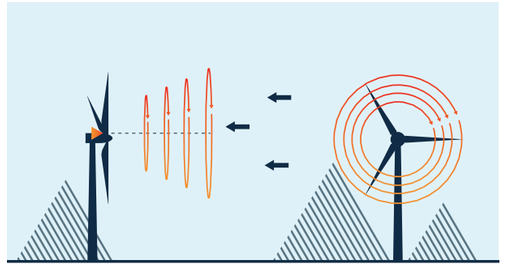
Lidar Wind Lidar beam



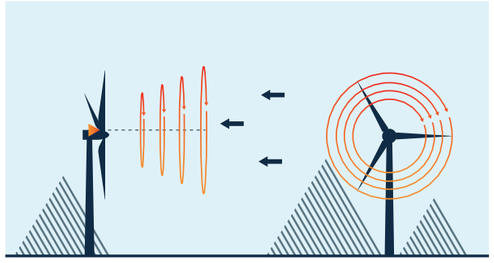
Stand alone wind measurements



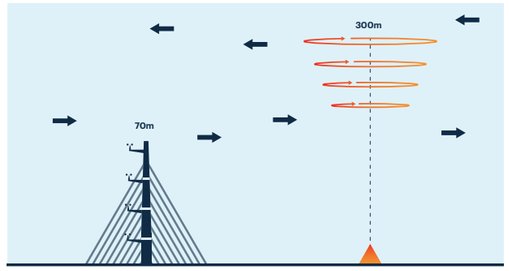
Verify your met mast



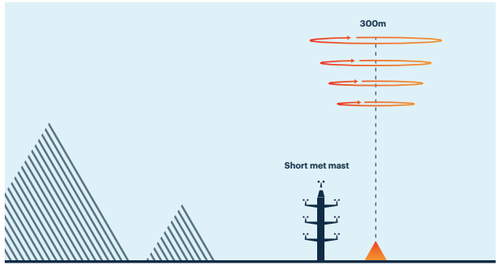
Power Curve Measurements from the turbine, including IEC 61400-50-3



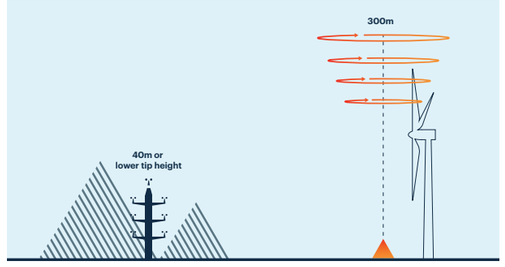
Wind resource asssesment & site optimisation



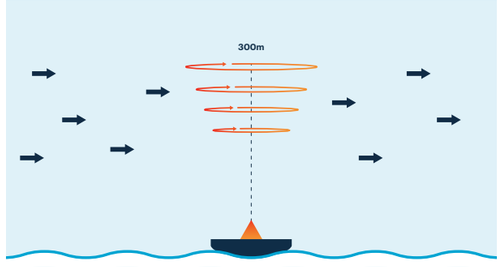
Complement and go beyond your met mast measurements



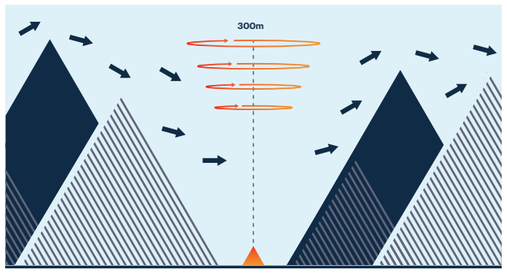
Combine fixed short met masts with roaming Lidar



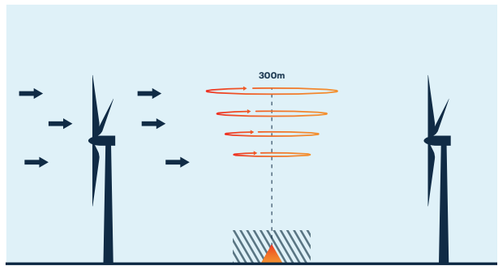
Site Calibration to IEC 61400-12-1: 2017 Annex C



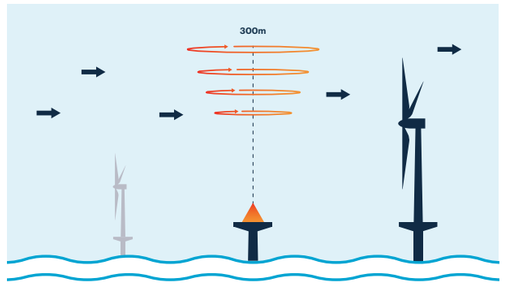
Stand alone wind measurements



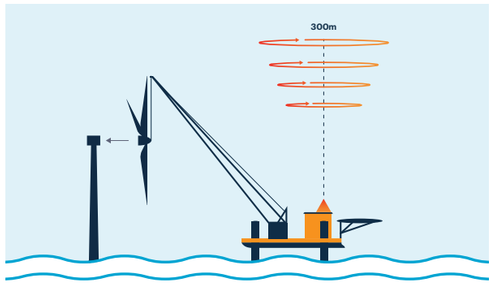
Working in complex flow



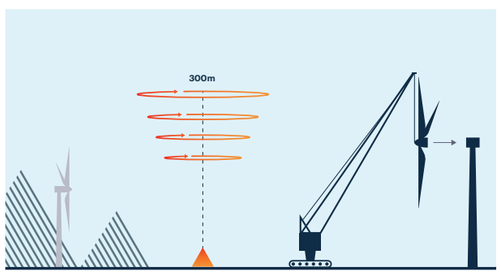
Permanent Met Lidar



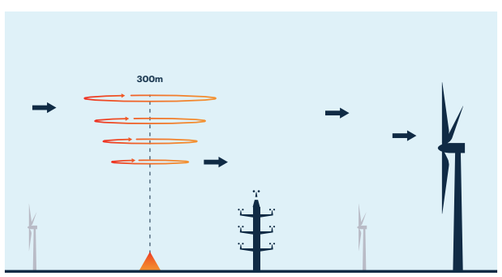
Offshore Permanent Met Lidar



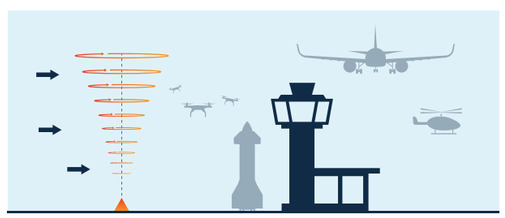
Offshore construction and operations & maintenance wind monitoring



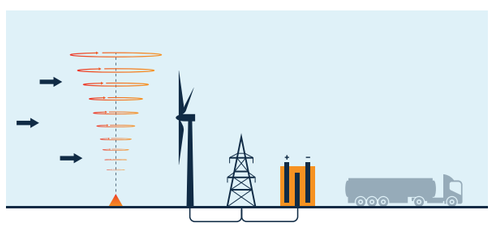
Crane lift monitoring



Power Curve Measurements to IEC 61400-12-1: 2017



Wind monitoring for droneports, spaceports and airports



Wind measurements for green hydrogen projects

Your Lidar adventure starts today by speaking to ZX Lidars.

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ZX Lidars

ZX Measurement Services