MMATIDIA
A NEW LOOK AT LIDAR

LASER RADAR IN THE ENERGY SECTOR

Ommatidia's Laser Radar Technology

Ommatidia's Q1 system generates 128 beams of laser light, which make it possible to locally measure both sub-millimetre displacements and the vibration of large structures in real time.

What is a Laser RADAR?

Using Laser RADAR for structural monitoring of energy infrastructure allows for precise characterization of structural deflection under load with an accuracy of a few tens of micrometers. Additionally, the system can provide high sensitivity vibration information about the points where the light is projected. One advantage of using Laser RADAR for infrastructure monitoring is that it does not require markers or manual intervention, and can offer long range and high distance accuracy.

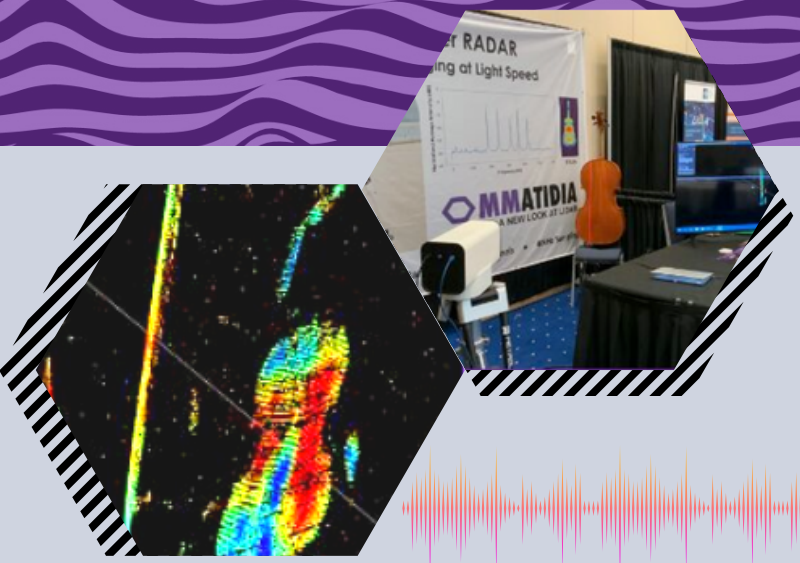
Why Ommatidia?

The long range and speed of Ommatidia's Q1 permits usage in contexts where optical metrology laboratory techniques such as trackers or laser vibrometers cannot be applied. It provides excellent range and field usability without compromising on performance.

What are the advantages?

- Ready for field deployment (IP54).
- High accuracy dimensional metrology for heliostat evaluation.
- Non-contact structural characterization of wind turbines in minutes.

Q1



Metrology instrument

The digitization of industry demands high-quality 3D data on products and processes. For this reason, Ommatidia's new Q1 offers the range and ease of use of a laser scanner with metrology-grade accuracy.

"Dimensional metrology and vibrometry with a single instrument"

About the Q1

With its 128 parallel channels, it has the ability to provide metrological grade measurements with a range of up to 50 m, with automatic scanning in seconds and directly on a wide range of surfaces. Additionally, the Q1's long range and speed allow it to be used in contexts where standard optical metrology techniques cannot be applied. The system is designed for use in the field both indoors and outdoors, with IP54 protection and robust mounting, and includes vibrometry imaging, which reveals the dynamics of structures without the need for contact and expensive inspection campaigns. instrumentation.

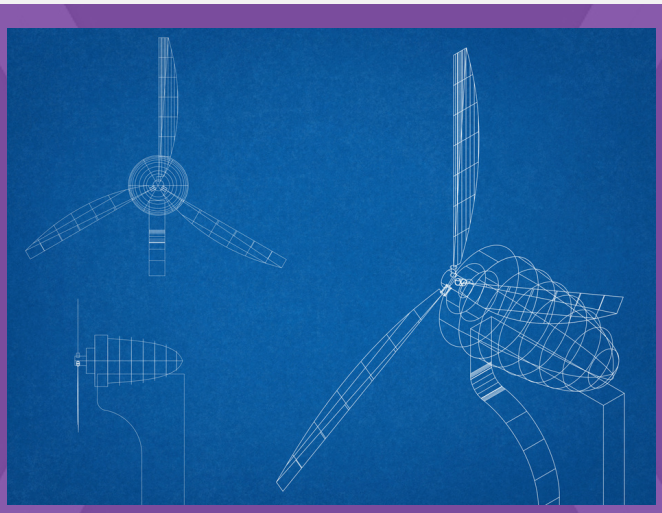
Your Industry 4.0

Ommatidia's Q1 connects the real and digital worlds by providing high-quality 3D data about products and processes, and the support required to convert it into customer value. This enables our customers to stay ahead in the digitalization race. Our in-house capabilities and world-class network of partners support integration into various industries and develop tailored solutions.

Ommatidia technology for the energy industry

Structural health monitoring (SHM) is a crucial aspect of wind turbine maintenance, as it allows operators to detect and diagnose potential issues in the tower before they become critical and result in costly downtime. There are a number of different factors that can affect the structural integrity of a wind turbine tower, and SHM systems are designed to detect and analyze these factors to provide early warning of potential problems.

"PROVIDES NON CONTACT MEASUREMENT "



One of the primary concerns for wind turbine towers is fatigue caused by the constant bending and twisting of the tower as the turbine blades rotate. Over time, this can lead to the development of cracks in the tower, which can ultimately result in the failure of the structure if left unchecked. SHM systems can detect these cracks by using sensors to measure the strain on the tower and analyze the data for patterns that indicate the presence of a crack.

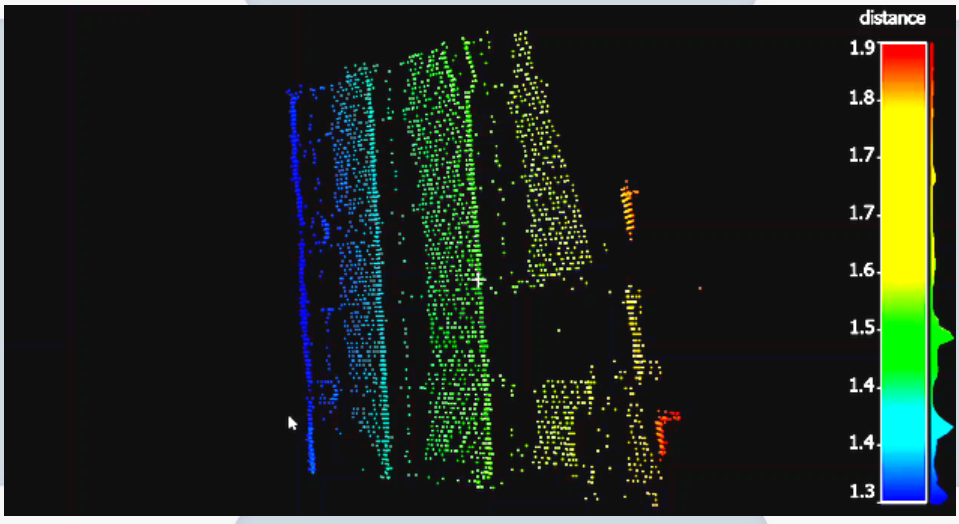
Ommatidia's Q1 has a GPS installed which allows microsecond accurate synchronization with other measument systmes if it is needed.

When continuous monitoring is desired, installation is greatly simplified thanks to the fixed version (Q1S) of our Laser RADAR allowes direct switchgear measurement .

Ommatidia technology for the energy industry

Another concern for wind turbine towers is corrosion, which can occur due to exposure to the elements, such as wind, rain, and salt. Corrosion can weaken the tower and make it more susceptible to failure, so SHM systems can be used to detect and monitor corrosion by using sensors to measure changes in the tower's electrical conductivity, which can indicate the presence of corrosion.

Wind turbine towers are also subject to vibration due to wind gusts and other factors. High levels of vibration can cause damage to the structure over time, so SHM systems can be used to monitor vibration levels and detect any unusual patterns that may indicate a problem.
In addition, temperature and humidity sensors can also be used in SHM system to track potential change in structural condition .



Overall, wind turbine towers require regular monitoring to ensure that they are operating within safe parameters and to detect any potential issues before they become critical. SHM systems can provide this monitoring by using a variety of sensors to measure and analyze different aspects of the towers

Ommatidia's Q1 has a GPS installed which allows microsecond accurate synchronization with other measument systmes if it is needed.

When continuous monitoring is desired, installation is greatly simplified thanks to the fixed version (Q1S) of our Laser RADAR allows synchronization with multiple units .

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Specifications

PARAMETER	VALUE	UNIT
Measurement Rate	0.5-50 m	m
Points per Line	128	points
Acquisition Speed	512-20,000	points/sec
Measurement Accuracy (MPE)	20+6µm/m	µm
Angular Range	30X360	º
Vibrometry Sampling Freq.	40	kHz
Vibrometry max in-band velocity	15.5	mm/s
Power Consumption	45	W
Battery (external) Operation Time	240	min
Interface	Ethernet	
Format	CSV/VKT/STL/PLY/TXT	
Mount	Thread 3½	Inch
Dimensions (w/o battery)	150x228x382	mm
Weight	7.5	kg
Pointer	~633	nm
Atmospheric Compensation	Pressure,temperature, humidity effects to MPE	
Temperature range (operation)	0/40	Cº
Environmental protection class	IP54	
Eye safety	Class 1M	
Wavelenght	1.55	µm
Geotagging	GPS	

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