



**MMATIDIA**  
A NEW LOOK AT LIDAR

# LASER RADAR FOR CIVIL ENGINEERING





# 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. That is to say, it projects 128 points of light that behave at the same time as gauges and precision accelerometers but without contact.

## What is a Laser RADAR?

Laser RADAR can resolve the 3D position of points on an object with an accuracy of a few tens of micrometers. This allows accurate characterization of structural deflection under load. Additionally, Laser RADAR provides high sensitivity vibration information about the points where the light is projected. Laser RADAR systems do not need markers or manual intervention, and can offer long range and high distance accuracy.

## What are the advantages?

Ommatidia's multibeam laser RADAR technology is a global first and offers multiple advantages in the field of civil engineering:

- It allows a dynamic and structural characterization of large infrastructures without the need for installation through the deployment of mobile units.
- When continuous measurement is desired, installation is greatly simplified by allowing Direct measurement from pillars or the ground, minimizing power points, cabling, and the need for access to overhead infrastructure.
- The sensitivity achieved is very high, allowing operational modal analysis with ambient excitation, with performance comparable to precision accelerometers.
- It allows both dynamic and static analysis thanks to its dual mode of operation (dimensional metrology and vibrometry), with a single instrument.
- The GPS synchronization and cloud access available to the equipment allows its integration into larger instrumentation systems.



# Q1V

## Dual mode of operation

The Q1V has been designed for a precise dynamic and static analysis.

**"Q1V measures the vibration with great accuracy"**

## What is the Q1V?

The Q1V is a variant of the original Q1, focused on the measurement of local deflection and vibrations in large civil structures or objects. To achieve this, special algorithms have been built-in to increase the sensitivity of the unit, allowing for operational modal analysis based on ambient excitation. This unit has been optimized to simplify fixed installation in different types of infrastructure. With its IP65 protection, it is suitable for long-term operation outdoors and its fixed construction also allows for cost-efficient deployment. The standard Q1 Laser RADAR is also an excellent tool for field deployment and mobile structural characterization, this device allows cost-efficient deployment.

## 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 industries 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.





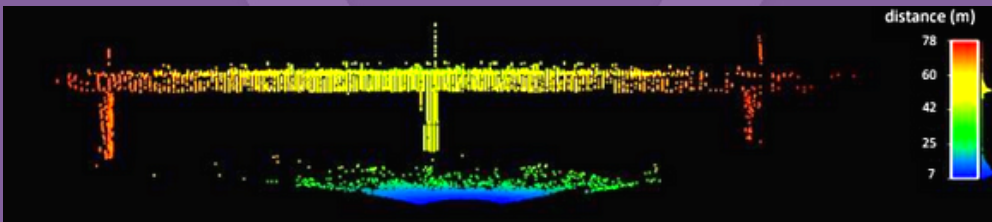
# Ommatidia applications in civil engineering



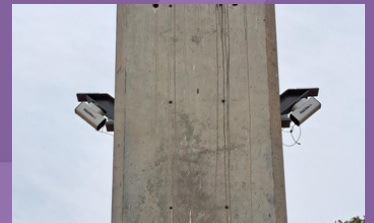
Ommatidia's Q1 contributes to ensure safety of civil construction. In a recent project, 4 Q1S were installed for our client ADIF under a high-speed train bridge.

## "NON CONTACT MEASUREMENT FOR 2 YEARS"

This project offers us the opportunity to show the capabilities of the laser in a real application context and integrate it together with other sensor technologies and industry 4.0 algorithms, to offer a global monitoring solution for preventive maintenance of a large number of types of infrastructure.



In the next two years, Ommatidia's solutions will collect detailed information on the dynamic behavior of infrastructure, with the goal of improving safety and reducing maintenance costs. We anticipate that the results of this project will lead to widespread implementation of our technology in rail infrastructure across Europe.



Ommatidia's Q1 is installed at the base of the bridge under the rail roads providing a perfect look of the bridge.



Our products prepared to be shipped for deployment.





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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+6 $\mu$ m/m	$\mu$ m
Angular Range	30X360	°
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	C°
Environmental protection class	IP54	
Eye safety	Class 1M	
Wavelength	1.55	$\mu$ m
Geotagging	GPS	

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