Galion G6000

A Doppler Scanning LiDAR suitable for any LiDAR use case.

The Galion G6000 pulsed Doppler LiDAR brings added value to projects in which detailed wind-measurements are crucial.

Large range capability The G6000 is capable of reaching distances up to 7470 meters, and it offers fast scanning times, a robust design and low power consumption.

User-friendly Designed to suit your needs, the LiDAR has an easy-to-use interface, all-sky 3D visualization, and full remote access.

Versatile applications Flexible in use, the Galion G6000 can be used in pre- and post- construction applications on- and offshore, that include complex terrain and extreme weather conditions.

Want to know more? Mail us at info@mecal.nl or check out our website.

Credits: Maddison McMurrin

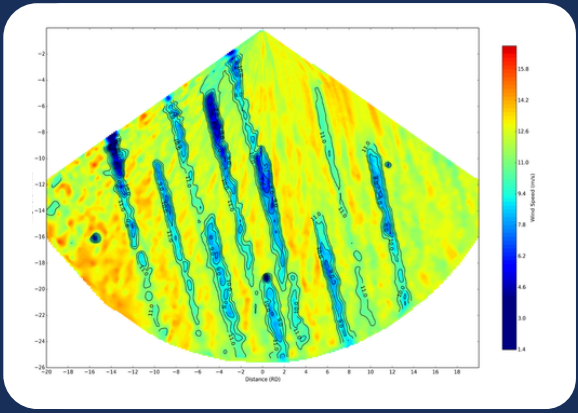
Full Project Lifecycle Capability

The Galion G6000 can support your needs through all project stages.

The G6000 pulsed LiDAR technology provides accurate and precise measurements for wind industry applications, and in combination with the high data availability, ensures valuable measurements for all wind industry projects. Remote measurement of wind characteristics is possible with ground or wind turbine nacelle based G6000, and the G6000 can provide versatile all-sky 3D visualisation of the wind flow.

Horizontal arc scanning

Fast & long range arc scanning with high spatial & temporal resolution provides detailed measurements and visualisation of wind velocity within wind farms.



The LiDAR provides the basis for successful measurements for use cases such as wind resource assessment, complex flow and terrain evaluation.

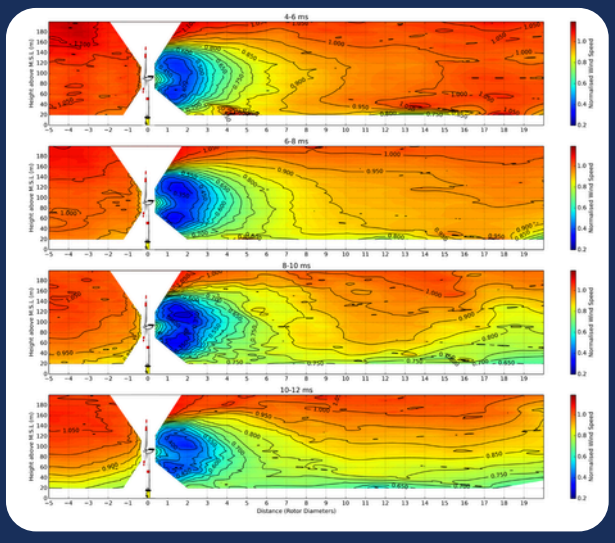
Research & development projects such as wind farm blockage effect and wind turbine wake studies can also be performed using the G6000.

Vertical arc scanning

Vertical scanning provides detailed measurements and visualisation of wind speeds and wind shear profiles within wind farms.

A turbine nacelle mounted G6000 will provide wind velocity measurements at multiple height intervals.

The G6000 facilitates scanning in complex terrain, offshore & onshore situations.



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Full Project Lifecycle Capability

The Galion G6000 can support your needs through all project stages.

Credits: Maddison McMurrin

Wind turbine nacelle based G6000 arc scanning

The versatile scanning LiDAR technology of the G6000 facilitates a wide range of single and multiple scanning patterns to maximise wind flow coverage.


Credits: Ben Soyka

The LiDAR's 7 km acquisition range, high scan speed and improved data availability provides high wind speed and wind direction measurement accuracy across the wind field in all wind shear and turbulence conditions.

The G6000 provides detailed information of large-scale and local wind flow conditions, for use in performance optimisation & benchmarking, wind farm control and optimization.


Credits: Dan Meyers Vouok


Credits: Sander Weeteling

The G6000 supports measurement of wind turbine induction zones and wakes, enabling assessment of the wind farm blockage effect.

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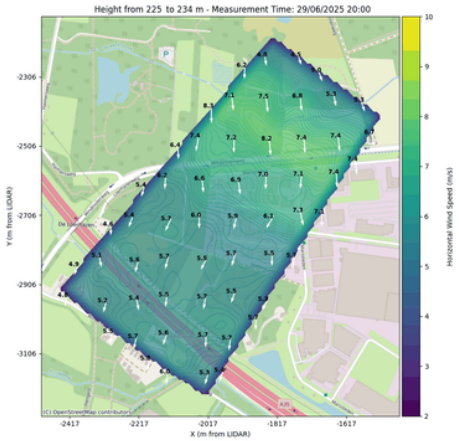
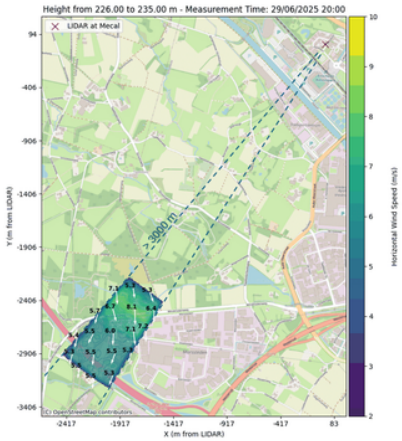
Galion G6000 Software

Operation of the Galion G6000 is facilitated through dedicated software.





These graphs are created from the data collected at Mecal headquarters.

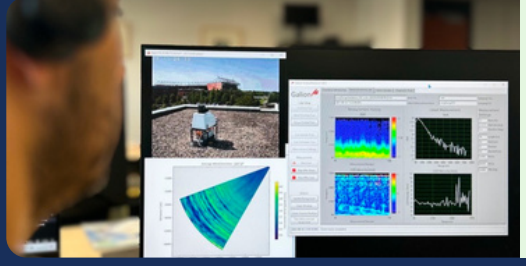
Galion-Software Features

- Display of historical and real-time Line-Of-Sight Doppler data, with detailed scan geometry and measurement campaign settings.
- All data is written in CSV format as well as NetCFD format. The user may use their own post-processing tool to further analyse the data, or use the Galion Toolbox software.
- GUI allowing quick and simple commissioning of the Galion and visualization of real-time spectral and Line-Of-Sight Doppler wind velocity data.
- Tools to aid Galion alignment and levelling; Tools for scan geometry design, creation of scan schedules, and measurement settings configuration.
- Access to condition data such as temperatures, humidity, voltages.

Galion Toolbox

The Galion Toolbox is a dynamic software application that is designed as a post-processing tool for data gathered with the Galion G6000, and is pre-installed on the computer of the Galion G6000.

The Galion Toolbox has been developed to process collected LiDAR point measurements to produce a time series of wind speed, wind direction and turbulence intensity data for all measurement heights. The Galion Toolbox provides 2D horizontal and vertical wind field flow maps facilitating visualisation of the wind flow.



Mecal support

Mecal offers reliable, insightful support at every stage. Our expertise turns complex challenges into practical solutions, ensuring each project meets the highest standards of performance and precision.

Want to know more?

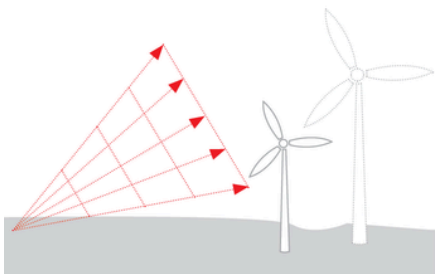
Mail us at info@mecal.nl or call +31 53 209 0090.

Wind Park Pre- and Post-construction Use Cases

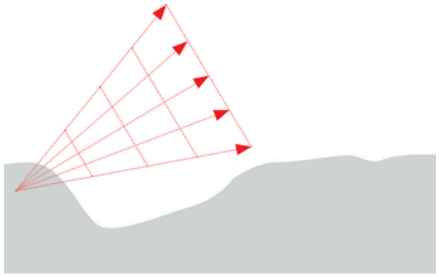
The Galion G6000 can support every stage of your project.

The G6000 provides detailed information of large-scale and local wind flow conditions, making it an excellent choice for use in performance optimization & benchmarking, wind farm control, and optimization.

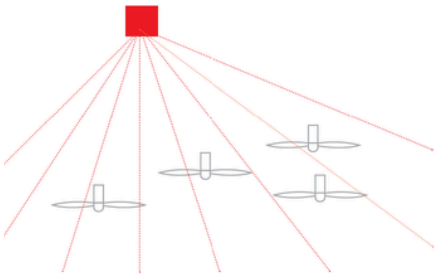
Moreover, assessment of the wind farm blockage effect is enabled through supporting measurement of wind turbine induction zones and wakes.



Vertical cross-section scan



Arc (horizontal cross-section) scan



Vertical cross-section scan

Pre-construction use cases

- Feasibility studies
- Wind resource assessment
- Site suitability and classification
- Site layout and optimization
- Wind flow model validation
- Complex flow and terrain evaluation

Post-construction use cases

- Power performance testing (PPT)
- Wake and Induction zone measurement and model validation
- Performance optimisation and benchmarking
- Operational energy yield assessment
- Operation and maintenance
- Yaw misalignment detection

Research and development

- Wind farm blockage effect and turbine wake studies
- Wind farm control and optimization
- Atmospheric science
- Multiple LiDAR setup, dual and triple LiDAR systems

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Further Use Cases and Applications

The Galion G6000 can provide data-driven insights in various use cases.

The Galion G6000 is a highly versatile LiDAR system designed to excel across a range of critical applications, from offshore wind farms and meteorological monitoring to airports and crane lifting operations.

Engineered for precision and adaptability, it delivers reliable wind and atmospheric data that empowers informed decisions, reduces risk, and enhances performance in demanding environments.

Meteorology

The G6000 is used to measure wind speed, direction, and atmospheric particles, helping improve weather forecasting and climate studies.

Crane Lifting

The G6000 monitors the surrounding environment and load position, supporting safe crane operations by detecting obstacles and measuring clearances.

Airports

The G6000 provides real-time wind shear and turbulence detection around runways, enhancing flight safety during takeoff and landing.

Further use cases

- Sports such as watersport, motorsport, or air sports.
- Research and development projects.

If wind is a concern in your project, reach out to us! Together we can find the best way to measure it with the Galion G6000.

Want to know more?

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G6000 Specification

Learn more about the Galion G6000's performance

Category	Specification
Physical specification	
Galion dimensions (L x W x H)	820 mm x 500 mm x 900 mm
Weight (Galion only)	90 kg
Weight (PSU only)	20 kg
Weight (packed flight case)	195 ± 5 kg
Flight case dimensions (L x W x H)	1200 mm x 800 mm x 1200 mm
Operational Characteristics	
Max acquisition range (RMaxA)	7,470 m
Max operational range (RMAxO)	6,000 m
Range gate length	30 m to 120 m (in 1 m increments)
Accumulation time	0.1 s to 3.0 s (2,000 to 60,000 pulses)
Doppler accuracy	± <0.1 m/s
Operating ambient temperature range	-30 to +40 °C
Inclinometer accuracy	± 0.03°
Scanner pointing accuracy	± 0.05° to 0.1°
Azimuth rotation range	360°
Elevation rotation range	-15° TO +195°
Scanner rotation speed	45 °/s
Power Specification	
DC Voltage	24 ± 1.0 V
DC Current	PSU fuse rating: 20 A; Max draw: 17 A
Power draw	Nominal: 150 ± 10 W Maximum (full heating/cooling): 400 ± 10 W
Laser Specification	
Laser safety glass	Class 1M
Wavelength	1550 nm ± 0.1%
Pulse width (FWHM)	200 ns (± 10%) or 30 m
Pulse repetition frequency	20 kHz
Sample frequency (spatial resolution)	250 MW (±10%)
Max LOS velocity	at least 31 m/s
Data storage	
OS Drive (C:\)	512 GB M.2 NVME SSD
Data drive (D:\)	2 TB 2.5'' SATA HDD
Backup drive (E:\)	2 TB 2.5'' SATA HDD

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We are **Mecal Applied Mechanics**, part of Mecal B.V.

Founded in 1989, Mecal has contributed to the wind sector in various ways, from detailed projects such as bearing design to large-scale projects like location development for new parks.

Furthermore, Mecal designed, manufactured, transported, and installed novel turbine tower designs that extended hub heights worldwide, resulting in higher energy generation and simplified transport.

After many successful projects and years of growth, we decided to focus on two projects: Mecal Nodes, and the Galion G6000 LiDAR.

With Mecal headquarters located in Enschede, the Netherlands, and Mecal Asia located in Tokyo, Japan, we operate worldwide.

Mecal B.V.

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