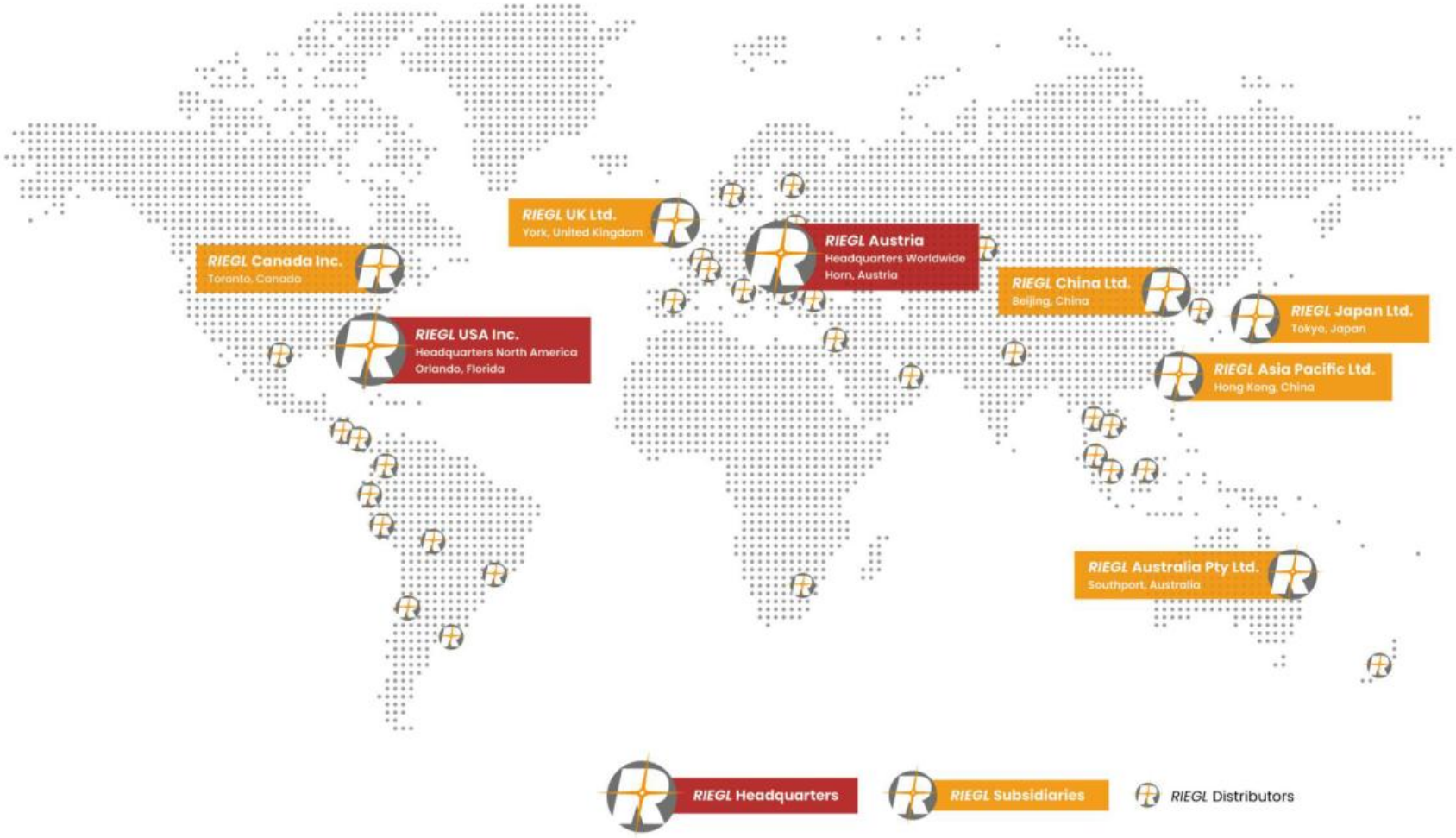
Austrian Technology Days 2024
March 16 - 23, 2024
Chongqing, Foshan, Hong Kong

# *RIEGL* Group of Companies

# *RIEGL Firmengruppe*

**Innovation in 3D**

*Dr. Lingxiao Zhu*
*RIEGL International GmbH*
*Vienna, Austria*


RIEGL UK Ltd.
York, United Kingdom
RIEGL Canada Inc.
Toronto, Canada
RIEGL Austria
Headquarters Worldwide
Horn, Austria
RIEGL China Ltd.
Beijing, China
RIEGL Japan Ltd.
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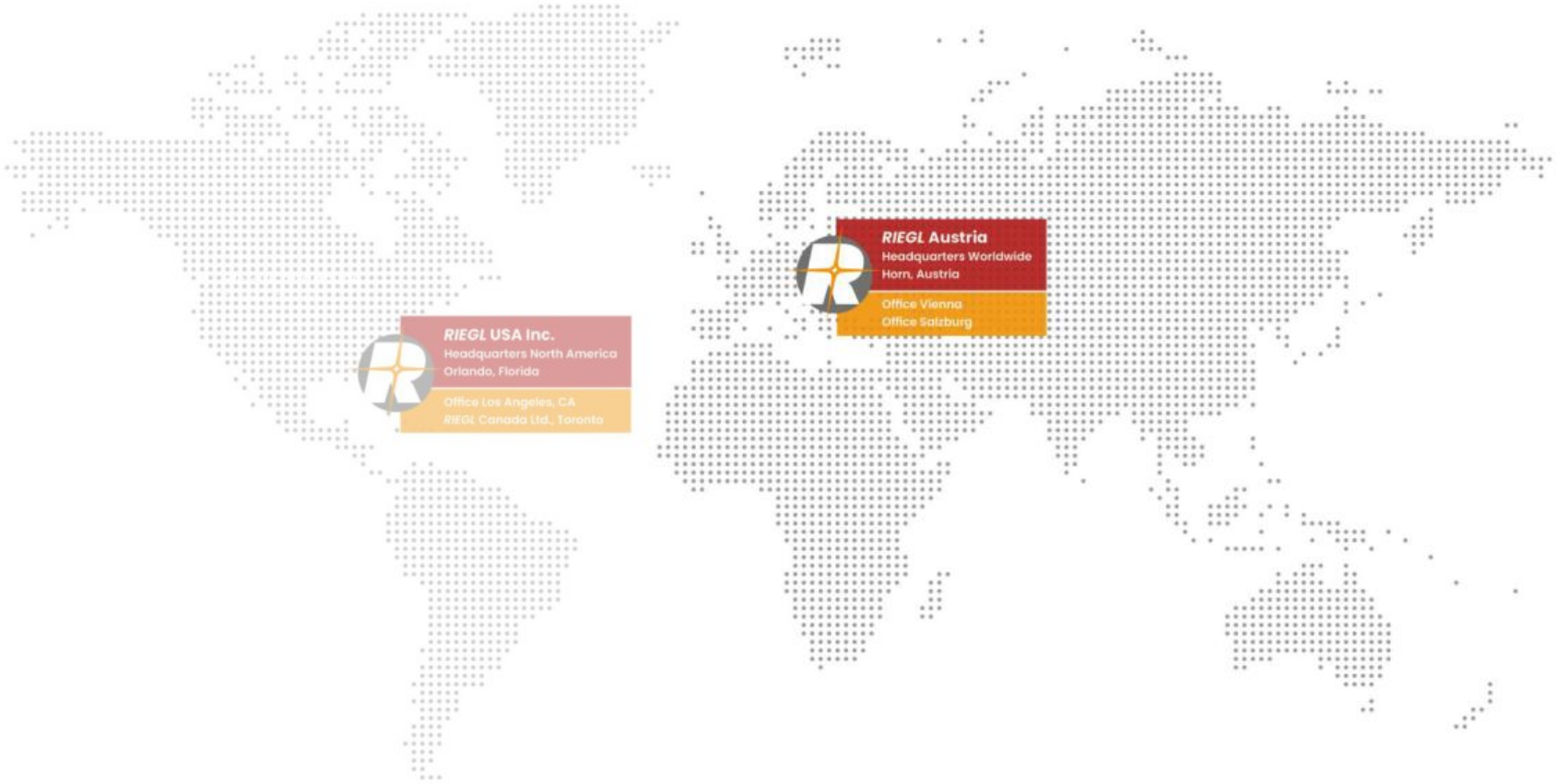
# *RIEGL* in Austria

# *RIEGL in Österreich*


RIEGL USA Inc.
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RIEGL Canada Ltd., Toronto
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Headquarters Worldwide
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Office Vienna
Office Salzburg

# Headquarters Austria | *Firmenzentrale Österreich*

***RIEGL* in Horn**

The ***RIEGL* headquarters in Horn, Austria,** provides – all in all in a number of buildings – more than 74,000 square feet of working space for research, development, pro-duction, testing as well as for marketing, sales, training, and administration.

In addition, 350,000 square feet of open space are available and used for product testing.

*Die **RIEGL Zentrale in Horn** bietet – verteilt auf verschiedene Gebäude – mehr als 6.850 m² Arbeitsfläche für Forschung, Entwicklung, Produktion und Tests sowie für Marketing, Vertrieb, Schulung und Verwaltung.*

*Weitere 32.500 m² Freifläche stehen für zusätzliche Tests zur Verfügung.*


1. **Prokschgasse 4**
   Marketing, Sales,
   Training & Administration

2. **Riedenburgstraße 56**
   Research, Software Development and UAV Sensor Production

3. **Riedenburgstraße 48**
   Research, Hardware Development and Scanner Production

4. **Wiener Straße 20**
   Mobile Laser Mapping Systems Production

5. **Riedenburgstraße 54**
   Mechanical Workshop

RIEGL®

# Headquarters Austria | *Firmenzentrale Österreich*

since 1996
*seit 1996*


since 2006
*seit 2006*

since 2014
*seit 2014*



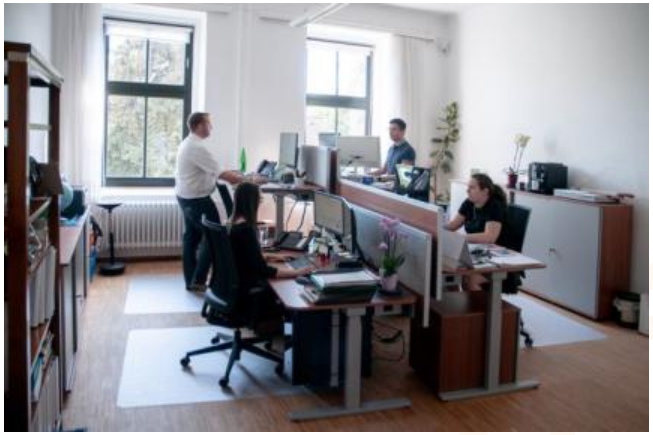
since 2021
*seit 2021*

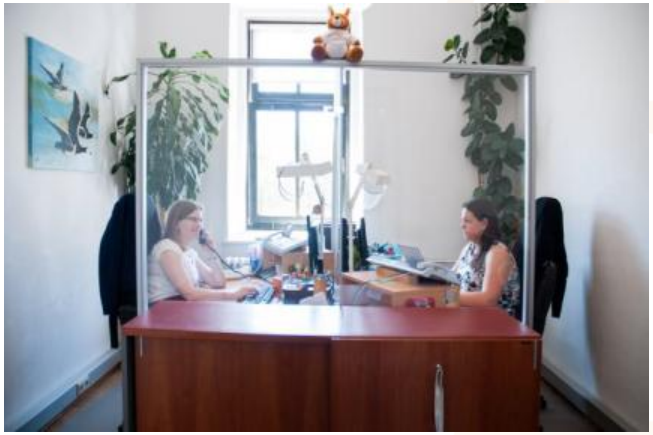
RIEGL

# 1 Prokschgasse 4

Marketing, sales, training, and administration are located in a marvelous building erected around 1900 in Prokschgasse 4, a cross street to Riedenburgstraße.

*Marketing, Vertrieb, Schulung und Verwaltung befinden sich in einem wunderschönen, um 1900 errichteten Gebäude in der Prokschgasse 4, einer Querstraße zur Riedenburgstraße.*





The special flair of the building is skillfully combined with the most modern equipment.

*Das besondere Flair des Gebäudes verbindet sich gekonnt mit modernster Ausstattung.*

RIEGL

# ❷ Riedenburgstraße 56


On the roof of the building: This is also where the long-range capabilities of the terrestrial laser scanners are tested.

*Auf dem Dach des Gebäudes: Hier werden auch die Messeigenschaften der terrestrischen Laserscanner bei größeren Entfernungen überprüft.*

The new production building in Horn has been available since 2021, doubling the available operating space. More than 26,900 square feet of additional working space expand the necessary company infrastructure to enable an efficient and up-to-date R&D and production.

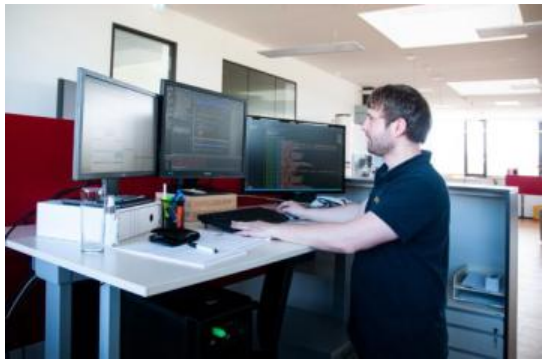
*2021 konnte das neue, zusätzliche Produktionsgebäude in Horn bezogen werden. Mehr als 2.500 $m^2$ zusätzliche Arbeits- und Aufenthaltsfläche erweitern die Unternehmensinfrastruktur und ermöglichen so eine effiziente und zeitgemäße Forschung, Entwicklung und Produktion.*

RIEGL®

# ❷ Riedenburgstraße 56

In addition to the best-equipped office rooms and conference rooms, the building houses a completely new production line. The heart of the facility are two fully automatic pick-and-place machines with upstream laser-based PCB marking and following quality control by an optical diagnostic device.

*Neben den bestausgestatteten Büro- und Konferenzräumen beherbergt das Gebäude eine komplett neue Fertigungsstraße. Herzstück der Anlage sind die beiden vollautomatischen Hochleistungs-Bestückungsmaschinen mit vorgelagerter laser-gestützter Platinenbeschriftung und Qualitätskontrolle durch ein optisches Diagnosegerät.*



Firmware and software department
*Firmware- und Software-Abteilung*


PCB (Printed Circuit Board) production
*Leiterplatten-Produktion*

UAV-sensor production
*UAV-Sensoren-Produktion*

RIEGL®

# ❸ Riedenburgstraße 48

Office *RIEGL* Research & Defense GmbH
*Büro der RIEGL Research & Defense GmbH*

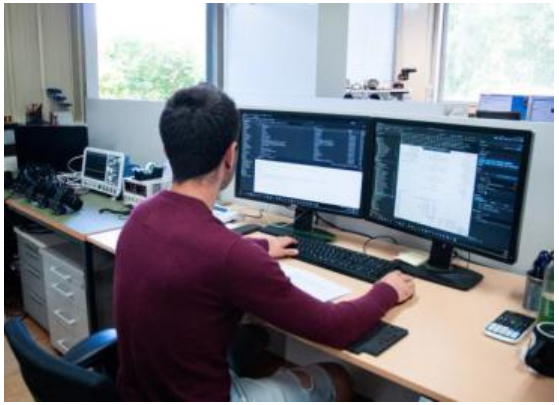
Bright, friendly offices, modern equipped workstations
*Helle, freundliche Büros, modern ausgestattete Arbeitsplätze*


In Horn, Riedenburgstraße 48, Research, Hardware Development and Scanner Production are accommodated.

*In Horn, Riedenburgstraße 48, sind Forschung, Hardware-Entwicklung und die Scanner-Produktion untergebracht.*

RIEGL

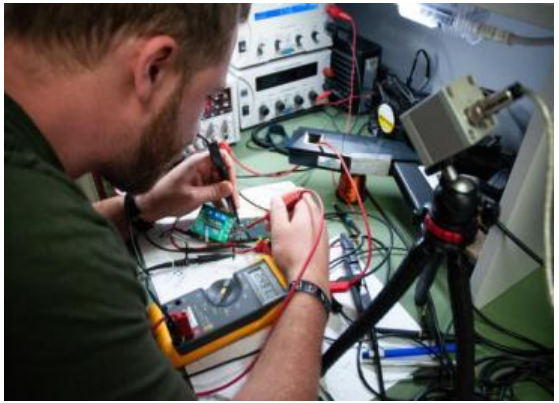
# ❸ Riedenburgstraße 48



High-quality technical equipment and facilities in the hands of highly qualified and motivated employees are the basis for the production of first-class innovative sensors.

*Hochwertige technische Ausstattung und Ausrüstung in den Händen von hochqualifizierten und motivierten Mitarbeitern ist die Basis für die Herstellung erstklassiger innovativer Sensoren.*

A look into scanner production | *Blick in die Scanner-Produktion*



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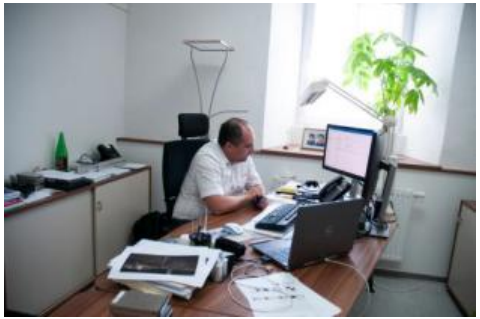
# 4 Wiener Straße 20

Housed in a rented old building, the production of *RIEGL*'s mobile surveying systems has sufficient space to ensure an efficient workflow.

*In einem angemieteten Altbau untergebracht steht der Produktion der mobilen RIEGL Vermessungssysteme ausreichend Platz zur Verfügung, um einen effizienten Arbeitsablauf zu gewährleisten.*

RIEGL®

# 5 Riedenburgstraße 54


Directly between the buildings in Riedenburgstraße 48 and 56, the mechanical workshop is situated. Here, the CNC production is located and enables *RIEGL* to manufacture complex mechanical components for the scanners.

*Direkt zwischen den Gebäuden in der Riedenburgstraße 48 und 56 befindet sich die mechanische Werkstatt. Hier ist die CNC-Fertigung untergebracht und ermöglicht es RIEGL, komplexe Mechanikteile für die Scanner herzustellen.*

RIEGL

# Sales Offices Vienna & Salzburg | *Büros Wien & Salzburg*
# Airfield Styria | *Flugfeld Steiermark*

In order to offer our international customers, most of whom arrive in Vienna and Salzburg, a conveniently located meeting point for initial discussions and meetings, we have our own offices in Vienna and Salzburg.

Additionally, a *RIEGL* Airfield for verification of *RIEGL*'s UAV LiDAR sensors – but also for demo flights – is available in Styria.

*Um unseren internationalen Kunden, die großteils in Wien und Salzburg ankommen, für erste Besprechungen und Treffen einen angenehm gelegenen Treffpunkt zu bieten, stehen in Wien und Salzburg eigene Büros zur Verfügung.*

*Zusätzlich steht zur Überprüfung der Leistungsdaten von RIEGL UAV LiDAR Sensoren sowie für Demoflüge ein eigenes Flugfeld in der Steiermark zur Verfügung.*

Office Vienna: Working space for sales officers and software engineers
*Arbeitsplätze für Verkaufs- und Softwaremitarbeiter im Büro Wien*

Office Salzburg
*Büro Salzburg*

Airfield for UAV tests and demo flights, Styria
*Flugfeld für UAV Tests und Demoflüge, Steiermark*

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# *RIEGL* Offices Worldwide

# *RIEGL Niederlassungen weltweit*


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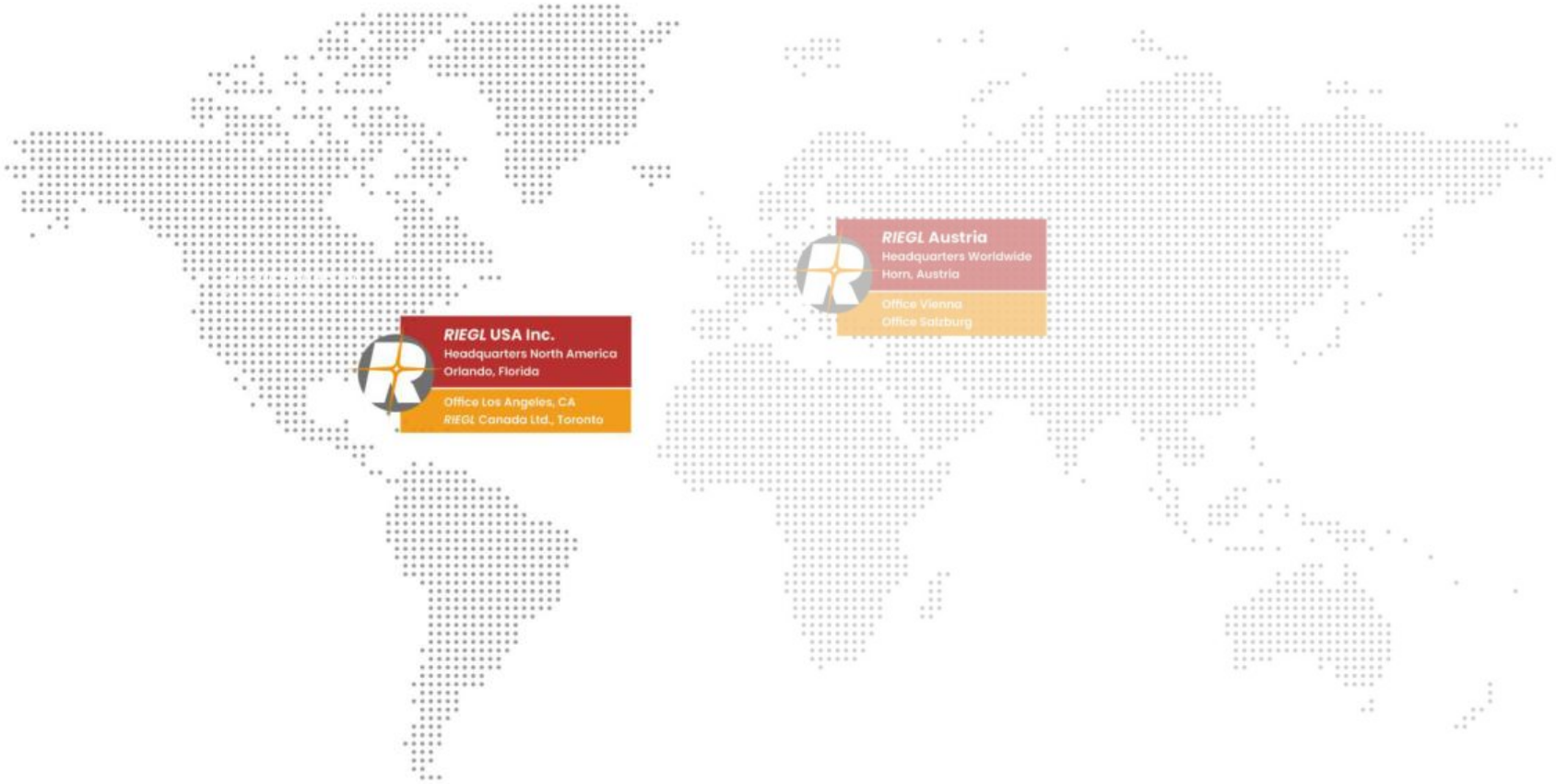
Hong Kong, China
RIEGL Australia Pty Ltd.
Southport, Australia
RIEGL Headquarters
RIEGL Subsidiaries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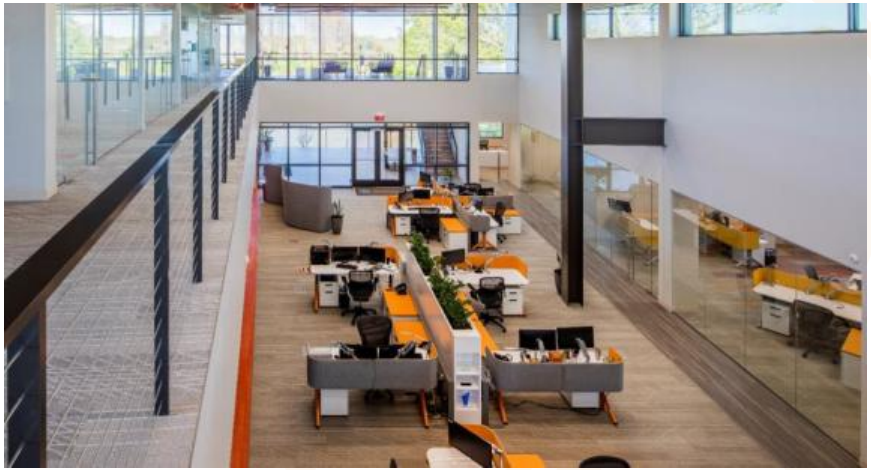
# Headquarters North America | *Firmenzentrale Nordamerika*


*RIEGL* USA Inc. under the leadership of Johannes Riegl Jr. is responsible for *RIEGL*'s North American business.
In November 2021, *RIEGL* USA moved to the new **North American headquarters in Winter Garden, Orlando, Florida.**

*Für das Nordamerika-Geschäft zeichnet RIEGL USA Inc. unter der Leitung von Johannes Riegl jr. verantwortlich.*
*Im November 2021 wurde die neue **Nordamerika-Zentrale in Winter Garden, Orlando, Florida,** eröffnet.*



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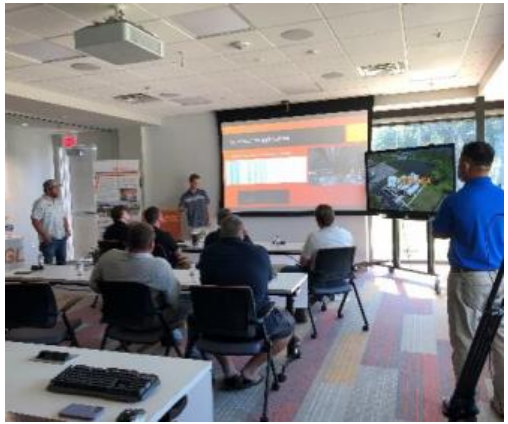
# Headquarters North America | *Firmenzentrale Nordamerika*


Modern and functional interior
*Moderne und funktionelle Einrichtung*



At **18,500 square feet** of modern office space on a total combined land size of 24 acres for sensor testing and calibration, the *RIEGL* USA team looks forward to provide optimal service to customers and prospects.

*In einem modernst ausgestatteten Bürogebäude* ***mit 1.720 m²*** *auf einem mehr als 9 Hektar großen Grundstück, welches für Sensortests und Kalibrierung genutzt wird, freut sich das Team von RIEGL USA darauf, Kunden und Interessenten optimal betreuen zu können.*

RIEGL

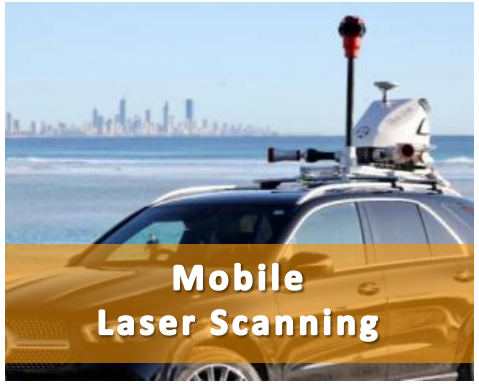
# *RIEGL* Laser Scanners & Scanning Systems

# *RIEGL Laserscanner & Scanning-Systeme*

# Hardware and Software News | *Aktuelles aus Hard- und Software*









RIEGL®

# Terrestrial Laser Scanning | *Terrestrisches Laserscanning*

















RIEGL®

# Terrestrial Laser Scanning | *Terrestrisches Laserscanning*

Extremely fast workflow, particularly suitable for large scanning projects
*Extrem schneller Workflow, besonders geeignet bei großen Scanprojekten*

High resolution true coloured point cloud of Clifford's Tower, York
*Hochauflösende, mit Fotodaten eingefärbte Punktwolke von Clifford's Tower in York*


## *NEW RIEGL* VZ-600i
**– High-Speed Laser Scanning for Professionals**

- 30 sec scan time for 6 mm resolution @ 10 m distance
- 60 scan positions per hour (with image acquisition)
- precise real-time onboard registration
- broad range capability (0.5 m up to 1000 m)
- 3D position accuracy up to 3 mm @ 50 m
- 3 internal cameras (offering optional on-board face detection and automatic facial blurring in real-time before image storage)
- GNSS receiver
- weight 6 kg / 13 lbs

## *NEU RIEGL* VZ-600i
**– High-Speed Laserscanning für Profis**

- 30 Sek. Scanzeit für 6 mm Auflösung in 10 m Entfernung
- 60 Scanpositionen pro Stunde (mit Fotoaufnahme)
- präzise OnBoard-Registrierung in Echtzeit
- großer Einsatzbereich (von 0,5 m bis 1000 m)
- 3D Positionsgenauigkeit von 3 mm in 50 m Entfernung
- 3 interne Kameras (mit optionaler integrierter Gesichtserkennung und automatischer Gesichtsunschärfe in Echtzeit vor der Bildspeicherung)
- GNSS Empfänger integriert
- 6 kg leicht

RIEGL

# Terrestrial Laser Scanning | *Terrestrisches Laserscanning*

### *RIEGL* VZ-400i / *RIEGL* VZ-2000i

- up to 1.2 MHz PRR, up to 500,000 meas./sec
- range up to 800 / 2,500 m
- accuracy / precision: 5 / 3 mm

- bis zu 1.2 MHz PRR, bis zu 500,000 Messungen/Sek.
- Messbereich bis 800 / 2.500 m
- Genauigkeit / Präzision: 5 / 3 mm

### *RIEGL* VZ-4000 / *RIEGL* VZ-6000

- up to 300 kHz PRR
- range up to 4,000 / 6,000 m
- accuracy / precision: 15 / 10 mm

- bis zu 300 kHz PRR
- Messbereich bis 4.000 / 6.000 m
- Genauigkeit / Präzision: 15 / 10 mm

RIEGL®

# Airborne Laser Scanning | *Airborne Laserscanning*

















RIEGL®

# Airborne Laser Scanning | *Airborne Laserscanning*


| VQ-480 II | VQ-580 II-S | VQ-780 II-S | VQ-680 | VQ-1560II-S | VQ-1260/VQ-1460 |
|---|---|---|---|---|---|
| 75° FOV<br>up to 1.25 MHz meas. rate<br>operating altitude AGL<br>up to 3,950 ft | 75° FOV<br>up to 1.25 MHz meas. rate<br>operating altitude AGL<br>up to 5,900 ft | 60° FOV<br>up to 1.33 MHz meas. rate<br>operating altitude AGL<br>up to 12,800 ft<br>*for customized system configurations* | 60° FOV<br>-20°/-10°/0°/10°/20° NFB<br>up to 2 MHz meas. rate<br>operating altitude AGL<br>up to 7,550 ft<br>*NFB (Nadir/Forward/Backward) Scanning for an optimal coverage of complex and vertical targets* | 58° FOV<br>forward/backward and nadir look<br>up to 2.66 MHz meas. rate<br>operating altitude AGL<br>up to 12,800 ft<br>*dual channel turnkey system for high altitude, large scale mapping* | 60° FOV<br>regular scan pattern<br>VQ-1460:<br>up to 2.93 MHz meas. rate<br>VQ-1260:<br>up to 1.47 MHz meas. rate<br>operating altitude AGL<br>up to 14,450 ft<br>*turnkey system for high altitude, large scale mapping* |

**for surveying at mid flight altitudes**
e.g. corridor mapping, city modeling, agriculture and forestry

**for surveying at high flight altitudes**
e.g. wide area mapping of complex environments

# *RIEGL* Aircraft | *RIEGL Flugzeuge*




**Two *RIEGL* planes** are available for verification of *RIEGL* airborne laser scanners and laser scanning systems as well as for demo flights.

***Zwei RIEGL-eigene Flugzeuge*** *stehen für die Überprüfung der Leistungsdaten von RIEGL airborne Laserscannern und Systemen - aber auch für Demoflüge - bereit.*

# Airborne Laser Scanning | *Airborne Laserscanning*

## *RIEGL* VQ-1260 / VQ-1460

**Waveform Processing LiDAR Systems for**
**High Point Density & Ultra-Wide Area Mapping**

- high pulse repetition rates of up to 2.2 / 4.4 MHz
- up to 1.47 / 2.93 million measurements per second on the ground
- best point distribution for optimum target resolution
- excellent atmospheric clutter suppression
- on-board graphical user interface for easy access to primary scanner parameters
- integrated inertial measurement unit and GNSS receiver
- prepared for the integration of up to two high resolution RGB/NIR cameras
- optimized for interfacing with typical hatches and stabilized platforms

## *RIEGL* VQ-1560 II-S

**Dual Channel Waveform Processing LiDAR System for**
**High Point Density & Ultra-Wide Area Mapping**

- high laser pulse repetition rate up to 4 MHz
- up to 2.66 million measurements per second on the ground
- offers highly efficient data acquisition at a wide range of point densities
- enables Multiple-Time-Around (MTA) processing of up to 45 pulses simultaneously in the air

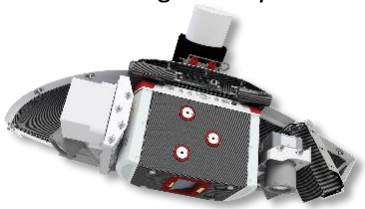
RIEGL®

# Airborne Laser Scanning | *Airborne Laserscanning*


## *NEW RIEGL* VQX-1 Wing Pod

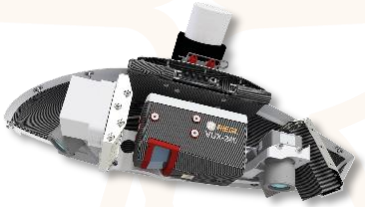
**Fully Integrated, Easily Mountable / Dismountable Airborne Laser Scanning Solution**

- **robust and reliable wing pod:**
  **the wing pod is designed to carry a wide range of *RIEGL* sensors**
  (VQ-480 II, VQ-580 II-(S), VUX-240[24], VUX-120[23], VUX-160[23] or VQ-840-G/-GL),
  an appropriate high-end IMU/GNSS system **and up to three high-resolution cameras**
- ready for user-friendly installation and straightforward application
  to facilitate various airborne mapping applications
- uncompromising lightweight construction
- quick installation and removal (including power cabeling)
- GNSS antenna to be mounted appropriately
- **EASA STC for Cessna 172-, 182- and 206- series**
- versatile configurability



*RIEGL* VQX-1 with VQ-580 II (-S)


*RIEGL* VQX-1 with VQ-840-G



*RIEGL* VQX-1 with VUX-240[24]

RIEGL

# Airborne Laser Scanning | *Airborne Laserscanning*

## *RIEGL* Helicopter Pods for Airborne Laser Scanning

- robust and reliable airborne scanner carrying platform
- full mechanical and electrical integration of sensor system components into aircraft fuselage
- quick installation & removal using the existing mounts (e.g. AirFILM Camera System); mounting and operation at end user's responsibility
- area exposed to wind approx. 0,114 $m^2$


### *RIEGL* VP-1 with *RIEGL* VUX-1

*RIEGL* VUX-1LR[22] or VUX-1UAV[22] LiDAR Sensor, IMU/GNSS unit with antenna, control unit, and digital camera(s) fully integrated

- total weight approx. 20 kg


### *RIEGL* VPX-1 with VUX-240[24]

*RIEGL* VUX-240[24] LiDAR Sensor, control unit, up to 3 Sony Alpha digital cameras and a high-end IMU/GNSS system with antenna fully integrated

- total weight approx. 20 kg

RIEGL

# Mobile Laser Scanning | *Mobiles Laserscanning*



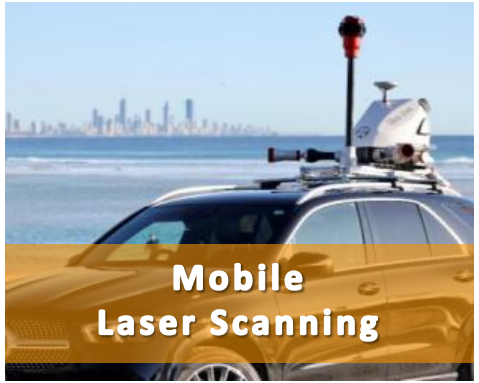
















RIEGL®

# Mobile Laser Scanning | *Mobiles Laserscanning*

ENHANCED PERFORMANCE

150 scan lines/sec
300 kHz eff. meas. rate

up to 4 cameras
including spherical camera

*typ. point density*
*550 points/m²*
*on pavement*
*surface @ 80 km/h*

**VMY-1**

ENHANCED PERFORMANCE

300 scan lines/sec
600 kHz eff. meas. rate

up to 4 cameras
including spherical camera

*typ. point density*
*1,100 points/m²*
*on pavement*
*surface @ 80 km/h*

**VMY-2**

250 scan lines/sec
1.8 MHz eff. meas. rate

up to 4 cameras
including spherical camera

multiple swivel positions for improved scan pattern in multi-pass applications

*typ. point density*
*3,200 points/m²*
*on pavement*
*surface @ 80 km/h*

**VMQ-1HA**

500 scan lines/sec
3.6 MHz eff. meas. rate

up to 9 cameras
including spherical camera and up to 2 highspeed pavement cameras

simultaneous capturing of spherical and directional imagery with a total resolution of up to 1370 MP/sec

*typ. point density*
*6,400 points/m²*
*on pavement*
*surface @ 80 km/h*

**VMX-2HA**

**A broad system portfolio serving all levels of applications:**

transportation infrastructure mapping, city modeling, GIS mapping & asset management, road surface management, open-pit mine surveying, rapid capture of construction sites and bulk material, HD mapping for autonomous vehicles

# Mobile Laser Scanning | *Mobiles Laserscanning*


RIEGL

# UAV-based Laser Scanning | *UAV-basiertes Laserscanning*

















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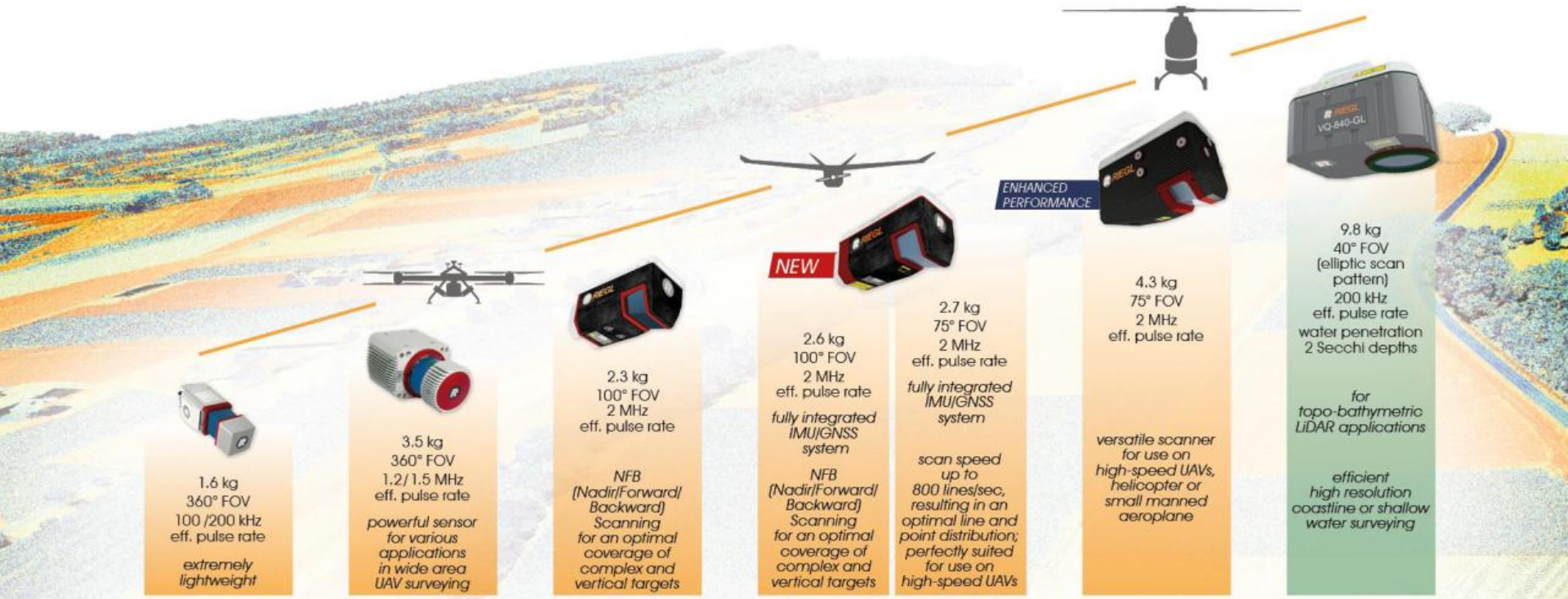
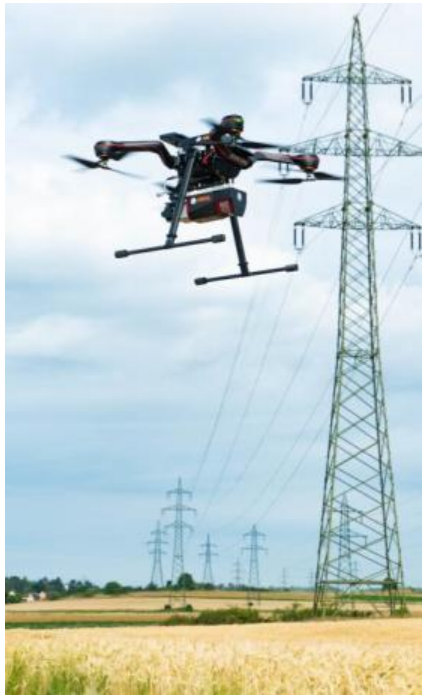
# UAV-based Laser Scanning | *UAV-basiertes Laserscanning*



# UAV Integration Examples| *UAV Integrationsbeispiele*



RIEGL®

# Bathymetric Laser Scanning | *Bathymetrisches Laserscanning*

















RIEGL®

# Bathymetric Laser Scanning | *Bathymetrisches Laserscanning*


2 Secchi depths

weight < 10 kg

ideal for integration on smaller UAVs

VQ-840-GL


2 Secchi depths

weight 12-15 kg (depending on configuration)

ideal for integration into UAVs with higher payload capacity and helicopters

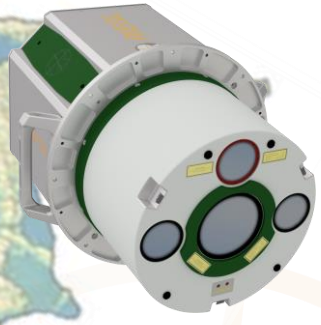
VQ-840-G


1.5 Secchi depths

weight approx. 70 kg

form factor optimized for integration into helicopters

VQ-880-GH



1.5 Secchi depths

weight approx. 65 kg

optimized for integration into fixed wing aircraft

compatible with stabilized mounting platforms

VQ-880-G II

**A broad system portfolio serving all levels of applications:**

seamless topo-bathymetric coastline and shallow water mapping, measurement for aggradation zones, natural habitat monitoring, surveying for hydraulic engineering, hydro-archaeological-surveying, river surveying, survey of water reservoirs and harbor infrastructure

RIEGL

# Industrial Laser Scanning | *Industrielles Laserscanning*

















RIEGL®

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*RIEGL* offers powerful scanners and scanning solutions for various fields of industrial applications. All these are exceptionally compact, reliable, and provide highest performance and longevity even in harsh and demanding environments.

## VZ-200 3D Laser Scanner

- 3D laser scanner for process automation of stackers and reclaimers, measurement of stock
- pilesand bulkmaterial, surveying and monitoring in topography and mining (e.g. BERM-monitoring)

## PH-VUX

- protective housing for *RIEGL* VUX-1 Series laser scanners

## *RIEGL* PH-400i/2000i and *RIEGL* PH-4000/6000-SRH

- rugged and robust industrial protective housing for *RIEGL* V-Line Terrestrial Laser Scanners
- hermetically-sealed, with thermo-electric coolers and forced-air cooling
- industrial standard connectors and supply cables
- application-specific interface and software solutions

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# Thank you for your kind attention.

# *Danke für Ihre Aufmerksamkeit.*

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