# RIEGL VZ-400i
combined with the
# RiSOLVE


**With registration completed during scene capture, a ready-to-use data-set is available immediately upon return to the office: Rapid data collection to full scene diagrams and analysis.**

- allows law enforcement to quickly capture accurate & measurable scenes
- promotes fast and safer scene clearing to get roads opened faster
- simple and easy to use, durable and rugged
- creates 3D court admissible data with 2-5 mm's accuracy
- automatically registers and colorizes scan data onboard the scanner in real time
- less than 1 minute per scan position with color images




# Documentation of Crash & Crime Scenes for Analysis and Investigation

## Typical Applications

• Accident Investigation • Architecture • Rapid Deployment Scene Capture • Emergency Management Planning
• Local Area Mapping • Utility Asset Mapping • City Modeling • Archaeology

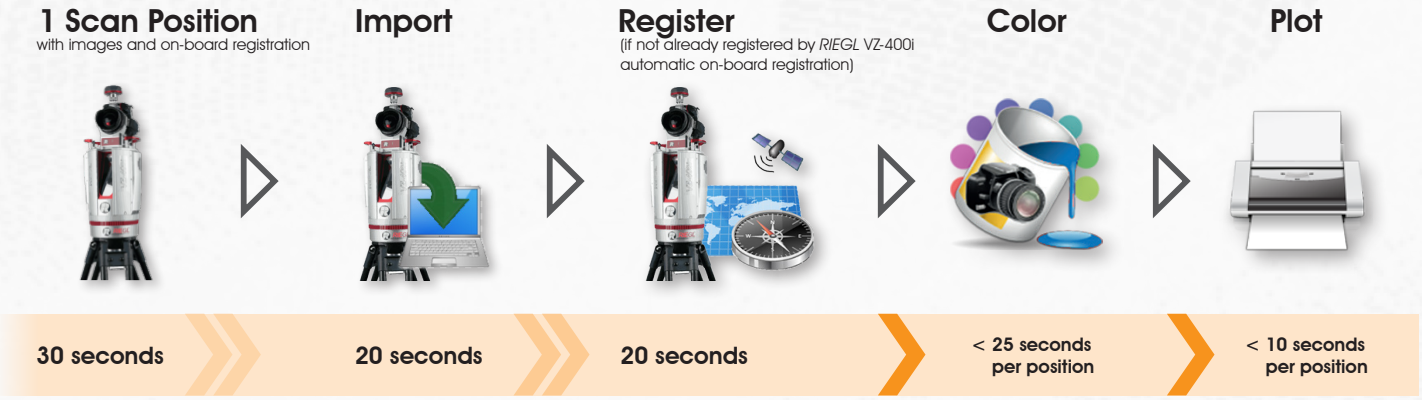
Scan this QR code to watch the RiSOLVE video.

www.riegl.com

RIEGL®

## *RIEGL* VZ-400i & RiSOLVE – Workflow

Less than 2 minutes from scan to measurable pdf plot!




## Main Features

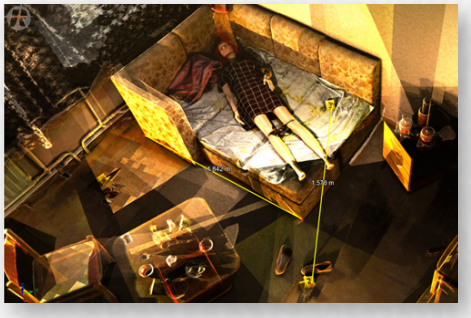
- fully automatic on-board registration on the VZ-400i
- drag & drop data import
- fastest true-color scanning workflow
- convenient calibration, registration, and filtering tools
- one-touch solutions
- 2D measureable PDF plots
- simple data import and export
- photorealistic 3D scans

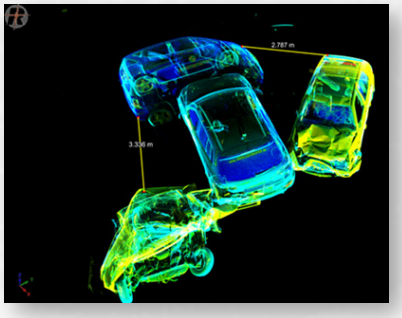
## Automatic Registration Methods

- Automatic Registration 2.0
- Direct Georeferencing
- GNSS Backsighting
- Backsighting

## *RIEGL* VZ-400i & RiSOLVE – Proven Technology, Fit for Purpose

The UK police have undertaken a series of tests over the past three years. The aim: to assess instruments for laser scanning are fit for purpose and to outline operating parameters and guidelines.
Conditions were set for accuracy both in the scan and with restoration. Operation in adverse weather (rain, snow, cold, high winds) was also examined. In all respects *RIEGL's* instrument (VZ-400, VZ-400i) met the challenge and exceeded the minimum set.
As a result *RIEGL* VZ-i series are the only scanners that can operate at all crime/crash scenes with automatic targetless registration, on board registration (no need for a tablet so no data streamed for the scanner to a 3rd party device: therefore secure), data redundancy with RSYNC so always leaving the scene with 2 copies of the data, simultaneous image capture leading to very productive (fast) scanning and data capture. The scanner was also tested and worked in a stable manner at wind speeds up to 45mph, in sub-zero conditions and of falling snow and in rain conditions which was very heavy at the most extreme of 3 samples. The registration is very robust even in such conditions, so the investigator can rely upon accuracy, minimizing measurement uncertainty and leading to high confidence in measurements information extracted.





## Our Motivation - Saving Time in the Field


After serious road traffic collisions it is standard practice to accurately document forensic evidence in an objective and timely manner. This evidence recovery process can be stressful and time-consuming, especially in conditions where hundreds or thousands of vehicles are lined up and waiting.

The software is designed to utilize all of the measurement inputs from the *RIEGL* VZ-400i scanner to enable a fully automatic workflow. Utilizing technological know how and real-world feedback from investigation officers and field experts, *RIEGL* has produced a one button solution for data processing. RiSOLVE accurately and automatically combines, adjusts, and colorizes the data collected in the field. The final results are a detailed point cloud and easy to use plot features which enable production of accurately scaled orthographic images exportable as measurable PDFs, TIFFs, JPGs and bitmaps.
**The Output of RiSOLVE is a photorealistic 3D scan.**

## Leading Technology in Software and Hardware

### RiSOLVE – Operating Principle

**RiSOLVE takes the complexity out of the registration process** by utilizing positioning information provided by sensors integrated into VZ-400i scanner. The combination of basic position estimation utilizing this onboard sensor data along with a new algorithm for aligning scans **without reflectors or precise positioning** enables a final fine adjustment of all scans to produce a seamless, fully registered point cloud.

**User Interface**

The software features a very simple interface which is crucial for reducing training time and improving adoption rates for police forces. With oversized buttons for the automatic tasks, RiSOLVE makes the transition from tradition to state-of-the-art effortless.

### *RIEGL* VZ-400i – 3D Terrestrial Laser Scanner Highlights

- ultra high speed data acquisition with up to 500,000 meas./sec, survey-grade accuracy ≤ 5 mm, 0.5 m - 800 m measurement range
- easy to use / easy to train: user-friendly touchscreen interface, single touch operation, etc.
- high accuracy, high precision ranging based on echo digitization, online waveform processing, and multiple-time-around processing
- new, innovative processing architecture for data acquisition and simultaneous geo-referencing, and automatic on-board registration in real-time
- MEMS IMU for pose estimation
- advanced flexibility through support for external peripherals and accessories, e.g. external Bluetooth GNSS receiver on top
- cloud connectivity via Wi-Fi and 3G/4G LTE
- various interfaces (LAN, WLAN, USB 3.0)
- integrated Human-Machine Interface (HMI) for stand-alone operation

## *RIEGL* VZ-400i Technical Data

- eye safe operation at Laser Class 1
- pulse repetition rate PRR (peak) 1.2MHz
- optional digital camera
- Wi-Fi and 3G/4G LTE
- max. measurement range 800m
- multiple target capability
- online waveform processing

| | |
|---|---|
| **Eye Safety Class** | Laser Class 1* |
| **Max. Range Target Reflectivity 90%** | 800 m |
| **Max. Range Target Reflectivity 20%** | 400 m |
| **Minimum Range** | 0.5 m |
| **Accuracy / Precision** | 5 mm / 3mm |
| **Effective Measurement Rate** | up to 500,000 meas./sec |
| **Scan Angle Range** | vertical: 100° horizontal: 360° |

*Class 1 Laser Product according to IEC60825-1:2014
Further information about the *RIEGL* VZ-400i in the appropriate datasheet.

## Typical Applications for RiSOLVE

- **City Modeling**

- **Architecture**

- **Archaeology**

- **Disaster Response**

- **Construction Site Monitoring**


- **Accident Investigation**

*RIEGL* VZ-400i
Data Sheet

YouTube
Watch our videos!
**youtube.com/riegllidar**

**References:**
*Review of Investigation and Closure Procedures for Motorway Incidents - Preliminary Report*

Departement of Transport, Highways Agency, Association of Chief Police Officers, Home Office
PDF document accessed through: webarchive.nationalarchives.gov.uk/20120607153510/http:/assets.dft.gov.uk/publications/review-of-investigation-and-closure-procedures-for-motorway-incidents-preliminary-report/review-of-investigation-closure-procedures-motorway-incidents.pdf, March 29, 2013

Visit our website to read the data sheets, and get further information, also about the broad *RIEGL* Product Line.



**www.riegl.com**

RIEGL®