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

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

Scan this QR code to watch the RiSOLVE video.
Innovation in 3D

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

Less than 2 minutes from scan to measurable pdf plot!

![Workflow Diagram](image)

**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

**RiSOLVE in Practice**

Dave Foster, one of the first working with RiSOLVE and the RIEGL VZ-400 laser scanner as Senior Collision Investigator UK Police, relays his real-world experience, "Results to date suggest a registration time of around 1 minute per scan position, or even slightly faster, with minimal button pressing. Think of this workflow: Import scan data > press registration > put kettle on > have biscuit > registration completed > apply color > finish cup of tea > produce scale plan from scan data."

Foster continues: "I'm sure there are other tasks which could easily be completed as the registration/coloring process is under way, but that is the point; I'm doing other tasks and processing the data, without having to work on it directly. The relative simplicity of this workflow will make broader deployment of laser scanning in the field more acceptable."

**Reduction of Costs & Time Exposure**

Metropolitan Police UK is working with RiSOLVE and RIEGL VZ-400 laser scanners since 2012. The instruments and the software have made a big impact on the investigative process for UK police officers who have made a significant investment in the technology. A year after the introduction of the scanners they conducted an audit to determine real-world performance of the systems. The audit found that on scenes where VZ-400s were utilized, roads were opened an average of 44 minutes earlier than with traditional technologies. Even in forensics, time is money! In 2011 the UK Department for Transportation estimated that each hour of road closure caused economic losses of £50,000.*

As police forces around the globe test and validate the experience of the UK CLEAR project, they are concluding similar findings: The RIEGL solution is proven, effective and cost efficient.

* Source: Review of Investigation and Closure Procedures for Motorway Incidents

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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**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Safety Class</td>
<td>Laser Class 1*</td>
</tr>
<tr>
<td>Max. Range Target Reflectivity 90%</td>
<td>800 m</td>
</tr>
<tr>
<td>Max. Range Target Reflectivity 20%</td>
<td>400 m</td>
</tr>
<tr>
<td>Minimum Range</td>
<td>0.5 m</td>
</tr>
<tr>
<td>Accuracy / Precision</td>
<td>5 mm / 3mm</td>
</tr>
<tr>
<td>Effective Measurement Rate</td>
<td>up to 500,000 meas./sec</td>
</tr>
<tr>
<td>Scan Angle Range</td>
<td>vertical: 100° horizontal: 360°</td>
</tr>
</tbody>
</table>

*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

References:
Review of Investigation and Closure Procedures for Motorway Incidents - Preliminary Report
Department of Transport, Highways Agency, Association of Chief Police Officers, Home Office

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