

Zehntner ZDR 6020 RL

Vehicle Mounted Retro-Reflectometer

The Most Advanced Road marking Retroreflectometer for use on Highways, City roads and Airport runways



Reliability

Vehicle-mounted with 300 measurements per second guaranteeing accurate and continuous coverage for all types of colors and road markings



Accuracy

Handheld precision at up to 150 km/h (93mph) without obstructing traffic and for all light conditions, even in bright sunlight

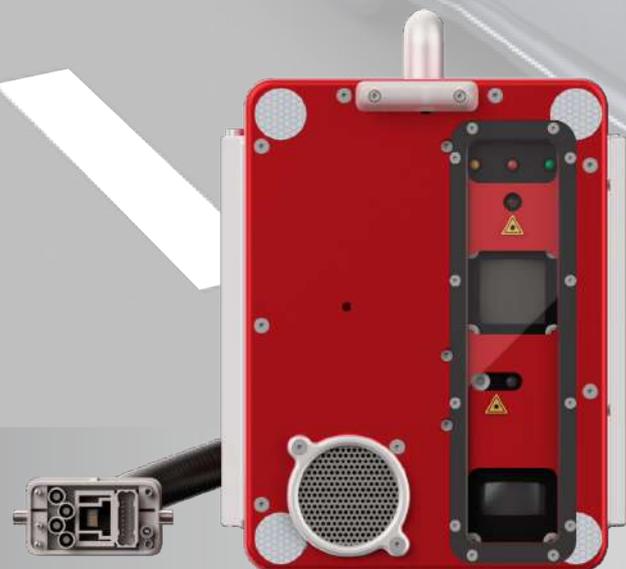


User Experience

Measurements can be evaluated with the free mapping and tools software on an industrialgrade touchscreen tablet with a multilingual user interface

Features :

- An advanced vehicle-mounted Retroreflectometer designed for **precise, efficient, and safe measurement of road marking retroreflection (RL)** — even during live traffic flow.
- Capable of operating at speeds up to **150 km/h (Max)**, it enables continuous, high-speed monitoring without disrupting traffic.
- The ZDR 6020 RL can evaluate **left and right-side markings**, including wide lines up to **1 meter**. **System provided with both left and right side mounting brackets, to allow mount ZDR6020 on either side of the vehicle for measurement.**
- **Mapping Tools software** automatically identifies and logs **double and triple line markings**, ensuring detailed and structured data capture suitable for use on highways, city roads and airport runways.
- With a capability of up to **300 measurements per second**, the system delivers **handheld-level accuracy**, regardless of ambient lighting — even under bright daylight. Ideal for **large-scale, real-time assessments**, it comes equipped with a **10-meter camera-based surveillance module**, a **rugged touchscreen tablet**, and **multilingual post-processing software** for seamless data analysis and reporting.
- It also supports future mobility by contributing to the standardization of markings critical for **ADAS (Advanced Driver Assistance Systems)** and **autonomous vehicle technologies**.



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Data Acquisition

- Measurements obtained from the measuring head
- Calculates an average value of all received sensor signals
- Verifies and filtering single values according to filter settings
- Averaging single measurements according to the given interval
- Stores the measured value together with additional information in the measuring file
- Current status of Any error & warning displayed, including Measuring head, GPS, Measuring file, and Camera
- Show Real-time RL bar graph display for driver guidance.
- One-click report generation and graphical mapping.
- Time diagram for RL-values.
- Measurement data can be saved, with Export to Excel or database integration.
- Calibration option built in for Measuring head & Speed Calibration w.r.t Vehicle Speed.
- Provides Setting option for Trigger mode (distance based in meter or Time based in seconds), Defining Averaging interval, No of Expected Marking (1,2 or 3) that will be detected, Minimum width, maximum width, RL pass fail value, Camera trigger (low/high)
- Various Filter options for Calculation & Display of RL value from the measured raw (Pass Fail filter (Low/high Limit), Marking width filter (Lower/Upper Limit), Marking Gap filter, Road Stud Filter, Day contrast Filter, Contrast filter, Average filter, Offset Difference Filter)

Multiple parameters recorded

- Chainage (km/miles)
- GPS Coordinates (GPS unit with DR)
- Date/Time
- Average Driven Speed
- Ambient Temperature (°C/°F)
- Relative Humidity (rH %)
- Day Contrast Ratio
- Pictures
- Voice



Night Visibility

Compliant with EN 1436 & ASTM 1710 (30 m geometry)



Touchscreen Display Mounted Next to Driver for One Man Operation

Measure
Project
Calibrate
Camera
Settings
Info

RL DB: 242 261
RL Live: 242 261
DC:

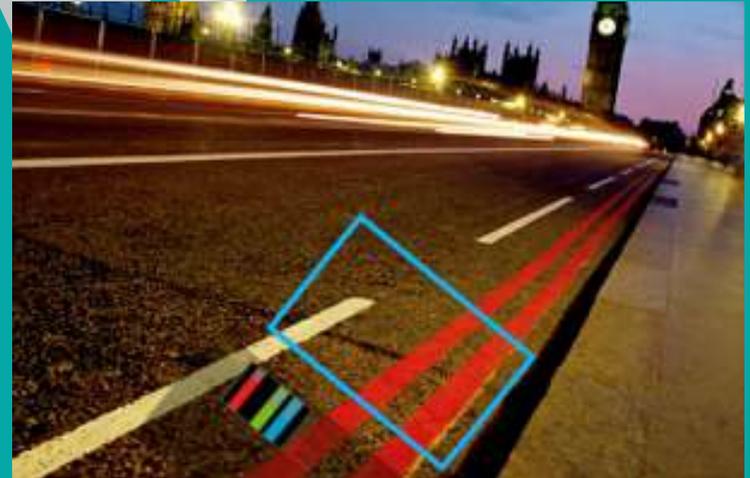
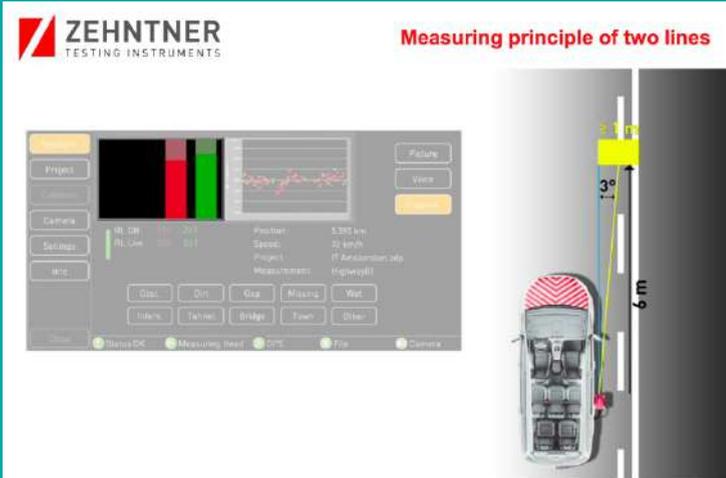
Position: 0.450 km
Speed: 72 km/h
Project: Versuch_006_Mk
Measurement: RS_04

Overtake Dirty Gap Missing Wet
Intersect **Tunnel** Bridge Town RWorks

Picture
Voice
Capture

Status OK Measuring Head GPS File Camera

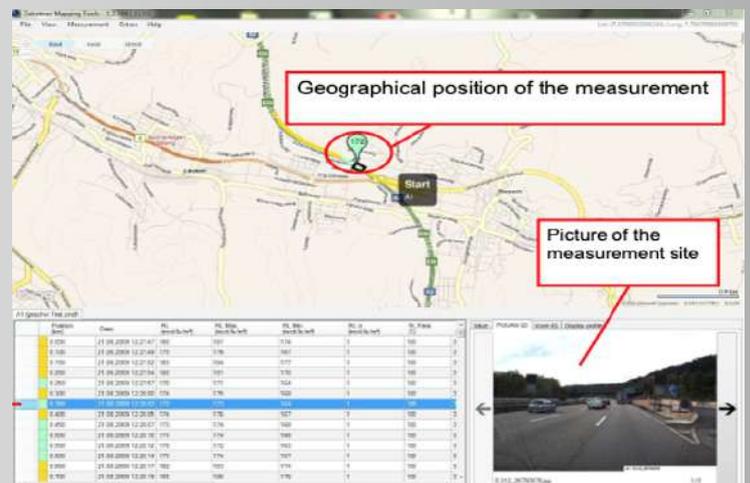
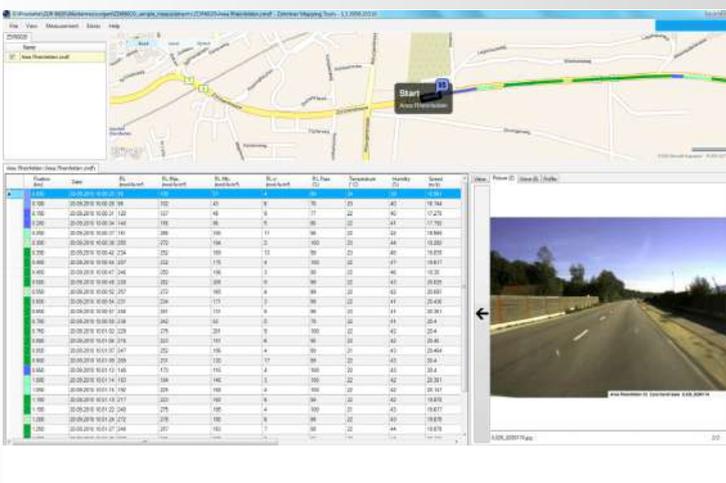
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Measuring range : 0 - 4000 mcd·m²·lx⁻¹
 Multi line measurement – Upto 3 lines.
 Measured area : ≥ 1000 x 880 mm (One side)

Double and even triple lines are recognized automatically and stored separately.

Convenient Data Analysis with Mapping Tools



- Built in 10Hz GPS with dead reckoning – where GPS signals are not available such as tunnels DR provides reliable positioning information.

- Integrated camera for automatic image acquisition - at 10m interval.

Real time & Continuous measurement of RL value (Max/Min), Images added to database where survey conducted, Date/Time of Operation, Temperature & Humidity conditions, combined with geographic locations where survey conducted.

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Technical Specifications :

| | |
|---|--|
| Measurement Rate | ≥ 300 measurements per second |
| Observation Distance | 30 m |
| Observation Angle | EN 1436: 2.29°; ASTM E1710: 1.05° |
| Illumination Angle | 1.24° (EN 1436), Entrance Angle: 88.76° (ASTM E1710) |
| Measuring Area | ≥ 1000 mm (W) × 880 mm (L) |
| Measuring Distance | 6 m |
| Measuring Speed | Up to 150 km/h |
| Measurement Range (RL) | 0 – 4,000 mcd/m ² /lux |
| Measurement Modes | RL, Day Contrast (DC), GPS, Temperature, Humidity, Speed, Image, Voice, Time |
| Trigger Mode | Automatic (distance-based or time-based) |
| Camera | Integrated auto-iris camera with 10 m interval picture sequence |
| Voice Recorder | Microphone included for live annotations |
| GPS | With Dead Reckoning (DR) for tunnels/urban environments |
| Power Supply | 12–16 VDC; Nominal: 20 A; Max: 33 A; Fused at 40 A |
| Laser Classification | Class 2 |
| Environmental Range | Operating: 0°C to +55°C; Storage: -15°C to +60°C; Non-condensing humidity |
| Software | Retro Data Grabber with MappingTools for visualization and reporting |
| File Format | Tab-separated, open-source ".xls" format compatible with Excel/Text editors |
| Standards Compliance | EN 1436, ASTM E1710, ASTM E2177, IRC 35-2015 |
| Safety & EMC | EN 60950-1, EN 50371, EN 55022, EN 55024 |
| Certification | StrAus-Zert, Germany (Test No. 0913-2009-05) |
| Dimensions (L×W×H) & Weight of Measuring Head | 270 mm × 207 mm × 310 mm & 10.5 kg |
| Dimensions (L×W×H) & Weight of Power Supply Unit (Car Box) | 360 mm × 150 mm × 450 mm & 8.5 kg |

Retro Reflective Road Markings is one of the most crucial element for ensuring road safety both during the day and at night, and also crucial to the use of advanced lane driving and ADAS systems being inducted into modern vehicles for ensuring road safety. To audit the desired reflectivity, road network testing is necessary during both execution and the Defect Liability Period (DLP). Audit of Pavement markings – is a mandated requirement.

1. What data is recorded with ZDR 6020?

- RL average values, day contrast ratio, GPS coordinates, chainage (position in km/miles), ambient temperature (°C/°F), relative humidity (rH%), driven average speed, picture, voice recording as well as date and time.

2. How many measurements can be taken with the system at a certain distance?

- The number depends on the driven speed and the chosen average interval. The system has a measuring frequency of 300 Hz. Usually 680 measurements are used for calculating the average value if the driving speed is 90 km/h and the average interval is 100 m.

3. How do I know to which place the RL values belong?

- GPS coordinates and chainage is automatically recorded and stored to the RL average values. Furthermore, we provide the possibility that the co-driver is able to insert references with the EVENT-buttons on our RetroGrabber software (e.g. roundabout, bridge, tunnel, wet, etc.) on the laptop which will also be stored. Additional pictures can also be taken every 10 m (32.81 ft), automatically, which will be stored to the RL value.