

# Next-generation measurements

New retroreflectometer technology enables users to capture the maximum information from signs and other retroreflective materials, which leads to better asset management for road owners

Words | **Kjeld Aabye, Delta, Denmark**

Safe traffic flow is highly dependent on the quality of road traffic signs and road markings. When driving at night-time on dark roads, retroreflection of road traffic signs and road markings is essential to help drivers to keep their vehicles safely positioned on the roads. Retroreflection

helps to reduce significantly the number of traffic accidents.

Road owners are responsible for ensuring that signs and markings perform according to the relevant standards and therefore need efficient and complete measurement tools to support this task. In the European Union, the

minimum retroreflection requirements are, among others, defined in EN 12899 for road traffic signs and EN 20471 for high-visibility clothing.



## Advanced post-processing

Retroreflectometers are primarily available as handheld devices for spot measurements. However, mobile units for ensuring a full performance overview at traffic speed are a small but growing segment. Retroreflectometers are usually supplied with software support allowing basic data processing and storage. In addition, modern instruments such as Delta's RetroSign GRX offer the use of an app for advanced post-processing of data, including comparing results with previous measurements; a sign library function with pass/fail options; and a database search function, thereby offering asset management features.

## RetroSign GRX, a modern solution

RetroSign GRX is a recent launch, offering a range of valuable features, of which several are new to such instruments. Technological advances have allowed the instrument manufacturer to add features that were not available or even possible in earlier generations of the instrument, while still keeping the retroreflectometer small and lightweight.

## Geometry and orientation checking

RetroSign GRX is based on point aperture geometry. This is a geometry reflecting the driver's perceptual experience when driving. An advantage of point aperture geometry is the ability to check if a direction-sensitive retroreflective sheeting has been mounted correctly on a sign – this is done by measuring the sign material in vertical and horizontal levels. The GRX has a built-in function to tell if, and how much, the instrument is rotated and if the instrument has been tilted when measuring, hence avoiding or at least reducing human errors in measurements. In addition, the GRX can report the orientation of the sign face and inform the owner if the sign is under high or low sunshine stress.

## Multiple angles

GRX has been designed to cover existing and envisaged future needs in relation to entrance and observation angles. The instrument is able to measure seven observation angles simultaneously, the angles available being: 0.2°, 0.33°, 0.5°, 0.7°, 1.0°, 1.5° and 2.0°. In parallel, the instrument has seven entrance (also called illumination) angles available to cover the demands of different standards. The possible entrance angles are: -4°, +5°, +10°, +20°, +30°, +40° and +45°. They are provided by using different angle adapters, mounted on the front of the instrument. This makes it easy and quick to adapt the GRX from one geometry to another.

RetroSign GRX is first and foremost designed for field work, but the wide range of available angles will also make it suitable for most laboratory measurement work.

## Color recognition and sign photo

RetroSign GRX automatically identifies sign colors and calculates the contrast between the background and legend colors – a possible future standard requirement. In addition, the instrument is able to take pictures of a sign. Such features make a sign evaluation program faster and easier to complete and reduce the likelihood of incorrect results. Using the GRX app and tablet solution makes it possible to mark sign defects or damage and add damage-specific information to the log file.

One of the new features of the GRX app is the ability to download a sign library. With this the instrument will semi-automatically be able to tell if a sign meets or falls short of the requirements of the national standard. Delta will initially launch a Manual on Uniform Traffic Control Devices (MUTCD) library focusing on the US market.

## Easy data handling

RetroSign GRX operates with a measurement setup consisting of templates, measurement series and inspections. Templates specify the data variables to be captured during an inspection; it consists of 13 predefined variables and the possibility to add further variables. Measurement series is a grouping of inspections, for example by geographical area, road or another defined area. Inspections are the measurements of the individual signs.

Measurement data can be transferred via USB to a PC for assessment in Excel or Google Earth or via wi-fi to the GRX app for storage, processing or mapping. With the use of a tablet, measured data can be sent to the company back office instantly after the measurement program has been finished if required.

## GRX – you acquire what you need

Each GRX instrument contains all the available features offered with the instrument, but availability of features is license-protected, allowing users to start with a low-cost, feature-restricted version of the instrument. If the need for additional features arises, these can easily be unlocked via the internet. In this way, GRX becomes a price-flexible instrument solution that doesn't limit the user to the model initially purchased.

## A solution for the future

RetroSign GRX is an instrument of today and for tomorrow – not just a retroreflectometer. The instrument itself provides easy capture of all data relevant for performance evaluation of road traffic signs, high-visibility clothing, license plates and retroreflective tapes. An optional app features an asset management solution for advanced data processing and presentations, including visual overview using Google Earth or other software mapping tools. ■



Above: Delta's RetroSign GRX has an easy-to-read full-color screen  
Left: A worker using the RetroSign GRX to measure the retroreflectivity of a road sign