

E A S Y L U X
RETROREFLECTOMETER

INTELLITEST
CONSULTING I EQUIPMENT I TESTING

WE ARE AHEAD.

Easylux specializes in the design of precision optoelectronic measurement systems.

Our innovative optical system is the result of more than 10 years of hard work by a non-conformist engineering team. **We clearly realized how unsafe and unsuitable big and heavy instruments are for road visibility control.**

The patented **MINI retroreflectometer** family is a turning point for the face of the standard retroreflectometers.

We are placing a new milestone. **Change your concepts** and leave the dinosaurs of retroreflectometers in the past.



4
MINI



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Classic Line



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Mobile & Software



INNOVATION.

RETROREFLECTOMETER

A retroreflectometer is an optoelectronic instrument that translates the human visual perception to numbers.

The MINI is a family of innovative retroreflectometers released in 2014 for on-site or laboratory measuring of retroreflection properties of road markings, road signs, road studs, safety clothing and other materials.

The exclusive external light suppression technology allows free access to the measurement area, even over strong sunlight.

On the following pages we will present our new technology and other innovations such as the quadruple angle vertical retroreflectometer and the dual angle road studs retroreflectometer.

CHANGE
YOUR
CONCEPTS

It is time to leave
the big, heavy
dinosaurs of
retroreflectometers
in the past.



Creating an entirely new design meant inventing entirely new technology.

Arrangement B - The length of the illuminated area is fully included within the length of the detected area.



STRONG AND MODERN

Built with modern, strong and flexible engineering plastics, aluminum and inox steel structure, the new MINI is a light and robust retroreflectometer.

MINI (MiniReflecto) Retroreflectometer family

The MiniReflecto handheld instruments are available in 3 different configurations:

- Horizontal, for retroreflection of road markings;
- Vertical, for retroreflection of traffic signs;
- Road Studs, for raised pavement markers - RRPM.

AA BATTERY SDCard

The MINI works with standard universal rechargeable AA batteries.

The LED optical system makes the instrument energy efficient and almost maintenance-free.

All measured data is stored as text files onto a removable SD Card.

The MINI works with rechargeable AA batteries.





AIRPLANE BAGGAGE CARRY-ON

All MINI family are airplane carry-on baggage size compatible.

You can now bring the carrying case with you in the airplane cabin.

Brains over brawn.

You no longer need to break your back using a retroreflectometer.



LOG DATABASE

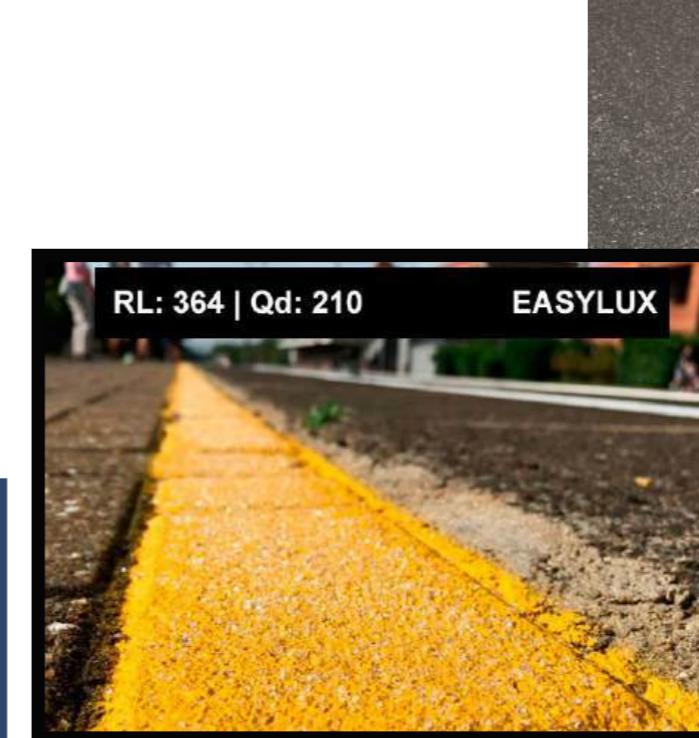
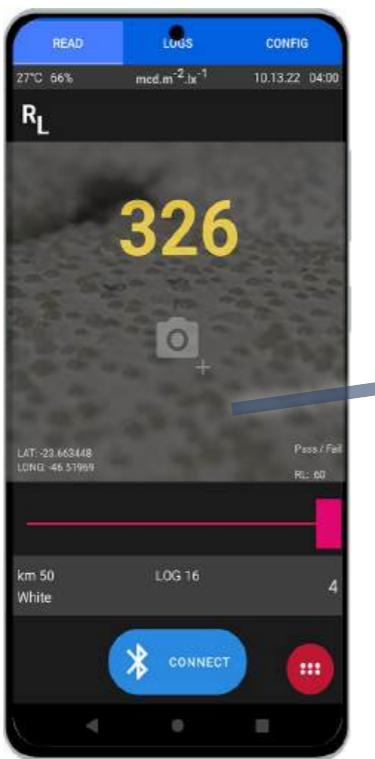
The measurements are organized on LOG files that can register important parameters:

- Road Name;
- Milestone mark;
- Operator's name;
- Direction (north, south, east, west);
- Material (paint, thermoplastic, prismatic, ...);
- Color;
- Place (left border, center line, etc.);
- Free notes (dusty, wet, sectioned, ...)





ANDROID
APP



Trigger measurements.
Share Data.
Take Pictures



ERGONOMIC ROAD MARKING CONTROL

Sun proof measurements.



HORIZONTAL Retroreflectometer

EN1436	RL Qd
ASTM E1710	RL
GOST	R54809
ASTM E2302	Qd
ASTM E2177	RL wet
ASTM E2832	RL2 (rain)

MINI Horizontal measures the night visibility **RL**, the Day Visibility **Qd**, the visibility under wet **RL wet** and continuous wetting conditions **RL rain** of road markings.

The patented MINI retroreflectometer optical system, combined with CIE eye sensor response, allows precise measurement of all types and colors of road marking materials, even profiled markings up to 15 mm.

Fast measurements: 0.6 s for RL, 0.9 s for RL + Qd.....immediately ready for next measurement.

Dimensions and Weight

Length	255 mm (without Qd)
Width	155 mm
Height	170 mm
Weight	2.1 kg (with battery)
Carrying case	470 x 380 x 240 mm

Electrical

Battery	Standard rechargeable AA size (6 units)
Charger	Automatic 100-240 V full range
Data memory	SD Card (4 GB minimum) (> 1 000 000 data points)
Display	Color transreflective, touch screen
Data Interface	USB, Bluetooth (optional)
Operating	-5°C to 50°C
Light source	LED light (maintenance free)

SMALL AND FAST

FAST Measurements:
0.6 s RL
0.9 s RL + Qd

Our new technology is almost 5 times smaller and lighter than the classic old technology.





WORK LIGHT

MINI Horizontal Features

- 30-meter geometry (15-meter 86.5°/1.5° available).
- Standard universal rechargeable AA battery.
- **External beam measurements for R_L and Qd .**
- Open measurement area, allows see what you are testing.
- Android Smartphone Bluetooth interface (optional).
- Temperature, humidity and inclination (% Tilt X and % Tilt Y).
- GPS (optional).
- User removable SD Card (8 GB).
- Color transreflective (sun readable) LCD with touch screen.
- LED technology - almost maintenance-free.
- Airplane carry-on luggage compatible carrying case.
- Adjustable handle and IrDA remote control.
- Fast measurements: **0.6 s for R_L 0.9 s for $R_L + Qd$**
.....immediately ready for next measurement.
- Measure flat and profiled markings up to 15 mm.
- Register the date, time, GPS, humidity, temperature, tilt %,...
- LOG facilities (Road name, milestone, color, material, ...)
- Free EasyData software for data analysis and reports.
- Calibration by ceramic reference - NIST / METAS traceable.

MINI Horizontal Technical

Illumination angle	1.24° (88.76°)
Observation angle	2.29° (1.05°)
Geometry	30-meter simulation distance (15-meter available) Arrangement B - The length of the illuminated area is fully included within the length of the detected area.
Observation aperture	±0.15°
Measurement area	58 x 350 mm
Measurement sensor	CIE V (λ) adapted
Measurement Range	R_L : 0 - 4000 mcd . m ² . lx ⁻¹ Qd : 0 - 400 mcd . m ² . lx ⁻¹
Measurement Time	0.6 s for R_L , 0.9 s for $R_L + Qd$
Profiled markings	Up to 15 mm

2 years warranty

Traceable Reference Standard

Easylux instruments are calibrated at a factory laboratory and traceable in accordance with standards issued by NIST or METAS.



30-meter geometry:

88.76° / 1.05° (ASTM E1710)

1.24° / 2.29° (EN1436)

ASTM E2832

R_{L2} (rain) compatible technology.

External beam retroreflectometer.

Free access over measurement area.

DIFFUSE LIGHT



Qd Day visibility (optional)

The patented foldable and removable Qd light source makes the user work simple and practical. The Qd light source can be removed if Day Visibility (Qd) measurements are not required.

Options MINI Horizontal add-ons

BlueTooth

WAAS GPS

Ergonomic KIT

Color CIE ASTM 2367



CONVENIENT
AND
SMALLER

15 mm

Profiled road markings
with no adjustments.



Approved

Test Certificate No. 0913-2014-04

Our innovative technology was approved
by an independent laboratory in Germany.



Approved

The MINI retroreflector technology was tested and certified by Russian Scientific Research Institute of Optical and Physical Measurements ~ VNIIOFI



Conditions of rain. Continuous wetting RL-2 compatible technology.

Free access over measurement area.

ASTM E2832

EN 1436

ABNT 14723

The MINI retroreflectometer instrument has an external light beam. That is, the light shines out of the instrument housing and onto the roadway away from the instrument.

The external beam instruments are essential for measuring retroreflectivity in the falling rain condition ASTM E2832.



LASER point

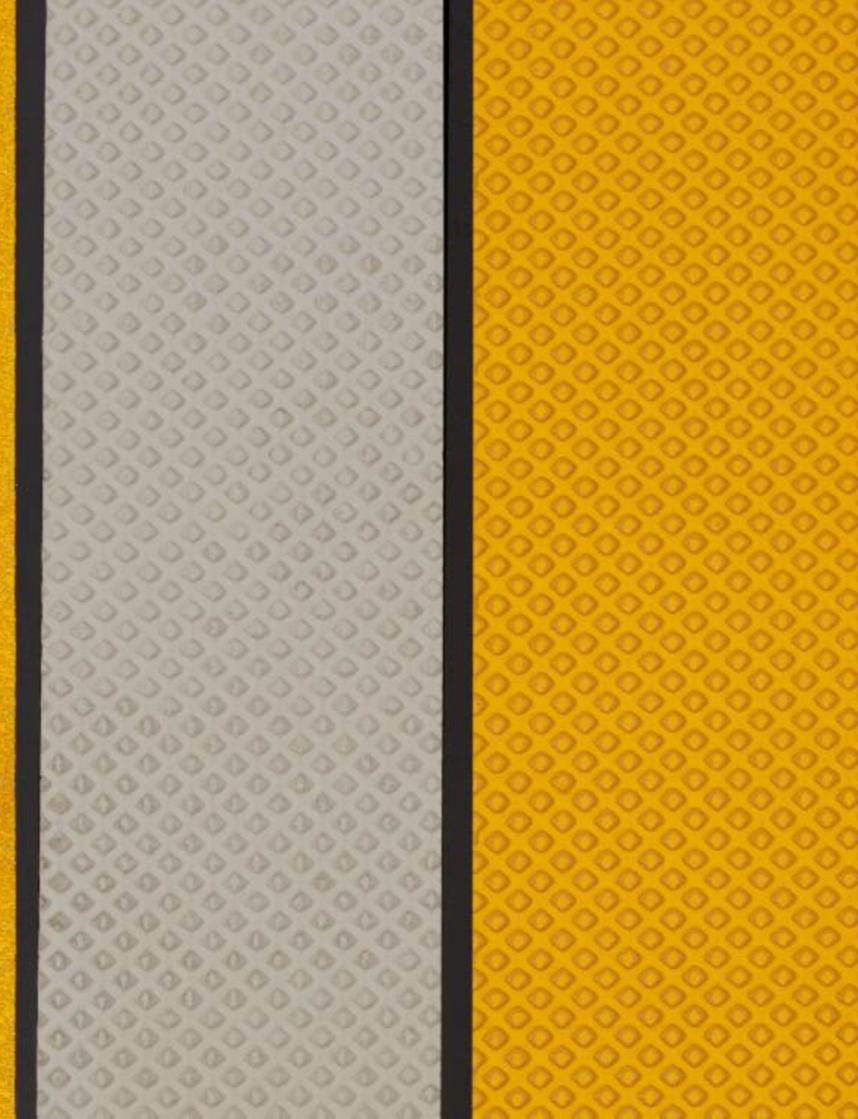
Optional high visibility green laser helps to find the measurement area, providing a visual reference point.



CIE chromaticity

The Easylux MINI for road markings can measure the nighttime reflected colour coordinates – CIE chromaticity - of white and yellow markings.

The colour coordinates are stored for each measurement, classifying them as belonging or not to the ASTM colour box.



The MINI has an **external light beam**. That is, the light shines out of the instrument and onto the roadway, ahead of the instrument for measurements of RL, Qd and nighttime reflected colour coordinates.



The Nylon Bag kit



MiniReflecto Horizontal measures the night visibility **RL**, the Day Visibility **Qd**, the visibility under wet **RL** **wet** and continuous wetting conditions **RL-2 rain** of all shapes and colors of road markings, even **RL** profiled up to 15 mm without adjustments.





- **Avoid Airplane extra fees.**
- **Avoid battery warnings.**
- **Increase the portability.**
- **Save space on the marking truck.**
- **Eliminate the operators fatigue by muscular effort.**
- **Speed up the processes of loading and unloading.**
- **Use standard AA-size batteries: easy to find and replace.**
- **External Beam technology (allows RL-2 rain test).**
- **15 mm profiled.**





The innovative design and unmatched portability saves space on the marking truck and speed up the processes of loading and unloading.



VERTICAL Retroreflectometer

ASTM E1709	0.2°
ASTM E2540	0.5°
EN 12899-1	0.2°, 0.33°, 2.0°
ISO 20471	0.2°, 0.33°, 1.0°, 1.5°
ECE 104	0.33°

The **MINI Vertical** is an up to four angle retroreflectometer designed to accurately measure the retroreflection R_A of road signs, safety clothing and other materials.

The innovative optical system can measure up to 4 (four) simultaneous observation angles. The entrance angle (β) can be fixed (-4° / +5°) or it can be continuously adjusted by the operator.

The combination of adjustable entrance angle with the exclusive quadruple simultaneous observation angles allows precise determination of retroreflection according to all international standards.

Dimensions and Weight

Length	255 mm
Width	155 mm
Height	170 mm
Weight	2.0 kg (with battery)
Carrying case	470 x 380 x 240 mm

Electrical

Battery	Standard rechargeable - AA size (6 units)
Charger	Automatic 100-240 V full range
Data memory	SD Card (4 GB minimum) (> 1 000 000 data points)
Display	Color transreflective, touch screen
Interface	USB, serial and Bluetooth (optional)
Operating	-10°C to 50°C
Light source	LED light (maintenance free)



Extension

Remote Control

Adjustable extension pole (0.6 m ~1.2 m) and a remote control make working with high-mounted traffic signs easy.

Options

MINI Vertical add-ons

BlueTooth

GPS

RFID Reader ISO 15693 and ISO 1443A/B

Barcode Reader

Extension pole

Color recognition



ASTM D4956
ECE 104
ISO 20471

The combination of adjustable entrance angle with the exclusive quadruple simultaneous observation angles allows precise determination of retroreflection according ISO 20471 - *High Visibility Clothing* and ASTM D4956 - *Standard Specification for Retroreflective Sheeting for Traffic Control*.

ADJUSTABLE

illumination angle

With built-in digital inclinometer for precise entrance angle control from 0 to 90°.

Automatic Color Recognition

Identify and Measures all types and colors of retroreflective materials.

Sun proof technology

The exclusive external light suppression technology allows free access to the measurement area.

DETAILED INFORMATION



MINI Vertical Technical

Illumination angle	-4° / +5° and continuously adjustable 0 to 90°
Observation angle	Up to 4 simultaneous Available angles : 0.2°, 0.33°, 0.5°, 1.0°, 1.5° and 2.0°
Observation aperture	0.1° annular aperture.
Measurement area	28 mm
Measurement sensor	CIE V (λ) adapted
Measurement range	R_A : 0 - 2000 cd . lx ⁻¹ . m ⁻²
Measurement time	1.2 s - 4 simultaneous observation angle
Standards	ASTM E1709, ASTM E2540, ASTM E1809, EN 12899-1, ECE 104, ISO 20471, DIN 67520, MUTCD, ABNT.

2 years warranty.

Traceable Reference Standard

Easylux Vertical uses a single reference standard to accurately measure all colors and types of materials. The reference is traceable to an accredited national standards laboratory.



ISO 20471

Retroreflectance of safety garments

The Easylux MINI Vertical retroreflectometer can implement 4 simultaneous observation angles. It is the only technology that is capable of fully complying with all requirements of ISO 20471 in a single unit. No special adaptors are needed.



MINI Vertical Features

- Available with 2 or 4 simultaneous angles.
- Suitable for safety clothing ISO 20471 and for ECE 104 inspection.
- Extension pole and IrDA remote control (optional).
- Free adjustment of Illumination Angle.
- Contactless - External light proof measurements.
- Built-in Digital Inclinometer for precise angle control.
- Temperature, humidity.
- GPS (optional).
- User removable SD Card (4 GB minimum) (> 1 000 000 data points).
- Color transreflective (sun readable) LCD with touch screen.
- LED technology - almost maintenance-free.
- Airplane carry-on luggage compatible carrying case.
- Fast measurements 1.2 s, 4 observation angles.
- Register the date, time, GPS, humidity, temperature, angle, ...
- LOG facilities as road name, milestone, color, material type, ...
- Free EasyData software for data analysis and reports.
- Multiple languages.
- Averaging facilities with continuously updating values.
- User configurable Trigger timer and Stop timer.
- Automatic sign color recognition.



UP TO 4 ANGLES
SIMULTANEOUSLY

Road Studs

Retroreflectometer

ASTM E1696	0.2° / 1°
EN 1463	0.3° / 1°

MiniReflecto is the unique Dual Angle road studs retroreflectometer in the world market.

The patented optical system was designed to measure the retroreflectance R_I of RRPM on site or in a laboratory with two simultaneous observation angles of 0.2° (or 0.3°) and 1°.



**FULL
CONTROL**

Thanks to exclusive stray light suppression technology the user has full access to the measurement area.

It makes correct field positioning and precise entrance angle control possible.

Road Studs Options

BlueTooth

WAAS

GPS

Ergonomic kit



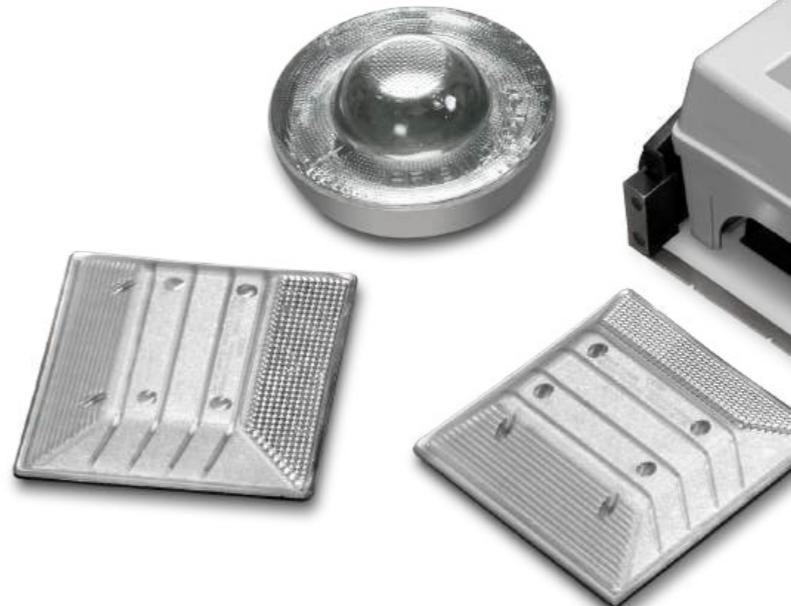
Dimensions and Weight

Length	255 mm
Width	155 mm
Height	170 mm
Weight	2.0 kg (with battery)
Carrying case	470 x 380 x 240 mm

Electrical

Battery	Standard AA size (6 units)
Charger	Automatic 100-240 V full range
Data memory	SD Card (4 GB minimum) (> 1 000 000 data points)
Display	Color transreflective, touch screen
Interface	USB, serial and Bluetooth (optional)
Operating	-10°C to 50°C
Light Source	LED light

ALL TYPES AND COLORS



Measures all types and colors of road studs (RRPM) on site or in the laboratory.

2 ANGLES SIMULTANEOUSLY

MINI Road Studs Technical

Illumination angle ($\beta_2 \beta_V$)	1.0°
Illumination angle ($\beta_1 \beta_H$)	0° or adjustable from + 45° to - 45°
Observation angle	0.2° (or 0.3°) and 1°
Observation apperture	0.1°
Measurement area	75 mm x 30 mm
Measurement sensor	CIE V (λ) adapted
Measurement range	R_f : 0 - 3500 mcd . lx ⁻¹
Measurement time	0.5 second
Standards	ASTM E1696, EN1463, GOST-R50971

2 years warranty.

Traceable Reference Standard

Easylux Road Studs uses a single reference standard to accurately measure all colors and types of road studs. The reference standard is traceable to an accredited national standards laboratory.



MINI Road Studs Features

- 2 simultaneous geometry: 0.2° (or 0.3°) and 1°.
- Free adjustment of entrance angle.
- External, light proof measurements.
- Full access to the measurement area at time of reading.
- Allows precise positioning on field.
- Easy entrance angle control.
- GPS (optional).
- User removable SD Card (4 GB minimum).
- Color, transreflective (sun readable) LCD with touch screen.
- LED technology - almost maintenance-free.
- Airplane carry-on luggage compatible carrying case.
- Fast measurements: **0.5 second** for each observation angle.
- Register the date, time, GPS, humidity, temperature, tilt %, ...
- LOG facilities as road name, milestone, color, RRPM type, ...
- Free EasyData software for data analysis and reports.
- Multiple languages.
- Averaging facilities with continuously updating value.
- User configurable Trigger timer and Stop timer.



RETROREFLECTANCE KIT

It does not seem possible. That you can bring all retroreflectometers - road marking, road studs, road signs - into a single light box. But it is.



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