



Retrosign GRX

Specifications

Measurement of the Coefficient of retroreflected luminance R_A (nighttime retroreflection) of road traffic signs, high visibility clothing, license plates and reflective tapes.

Geometry

Road traffic signs: EN 12899, ASTM E-1709 & ASTM E-2540
High visibility clothing: EN 20471 & ASTM E-1809

GRX-1

- Entrance / illumination angle: -4° or $+5^\circ$
- Observation angle: 0.2° or 0.33°

GRX-3

- Entrance / illumination angle: -4° or $+5^\circ$
- Observation angles: Three angles of 0.2° , 0.33° , 0.5° , 0.7° , 1.0° , 1.5° , 2.0°

GRX-7

Geometry:

- Entrance / illumination angle: -4° or $+5^\circ$
- Observation angles: 0.2° , 0.33° , 0.5° , 0.7° , 1.0° , 1.5° , 2.0°

Further entrance angles are offered as easy changeable front adapters for special measurement purposes: 10° , 20° , 30° , 40° & 45° .

The instrument uses point aperture geometry which enables the user to determine if direction sensitive microprismatic sheeting is correctly positioned on a sign.

Typical accuracy

- Repeatability: $\pm 2\%$
- Reproducibility: $\pm 5\%$

Measurement specifications

R_A and color recognition measured by sensors

Barcodes and QR codes measured by digital camera

Field of measurement, \varnothing : 25 mm / 1.0 inch

Spectral responsivity: According to ASTM E-1709 & E-2540

Range ($\text{cd}\cdot\text{lx}^{-1}\cdot\text{m}^{-2}$): 0 - 2000

The instrument automatically detects and compensates for ambient light.

Instrument dimensions & material

Length: 270 mm / 10.6 in

Width: 110 mm / 4.3 in

Height: 285 mm / 11.2 in

Weight: 1.9 kg / 4.2 lbs

Housing: ABS polymer

Regulatory compliance

EU

The equipment complies with the following directives of the European Parliament and of the Council:

- Directive 1999/5/EC of 9 March 1999 on radio equipment and telecommunications terminal equipment.
- Directive 2011/65/EU of 8 June 2011 on restriction of the use of certain hazardous substances (RoHS).
- Directive 2002/96/EC of 27 January 2003 on waste electrical and electronic equipment (WEEE).

The equipment is tested to the following standards:

R&TTE article 3.1a (health & safety):

- EN 60950-1:2006 + A11:2009 + A12:2010 + A12:2011

R&TTE article 3.1b (electromagnetic compatibility):

- EN 301489-1 V1.8.1:2008
- EN 301489-3 V1.4.1:2002

R&TTE article 3.2 (radio parameters):

- EN 300440-2 V1.4.1:2010

USA

The equipment complies with the following rule part of the Federal Communications Committee:

- FCC CFR 47 Part 15 Subpart B, Class A.

The equipment complies with the following safety specification:

- IEC 60950-1:2005 (2nd Edition); Am 1:2009

Electrical characteristics

Power supply:

- Rechargeable and replaceable Li-Ion 10.8 V 2.0 Ah

External chargers:

- 230 V / 50 Hz
- 110 V / 60 Hz
- Charge time: approx. 45 min

Data

Data memory: > 2 mio. measurements without pictures
> 2.000 measurements with pictures

Interface: USB memory stick (standard, to PC), WiFi (optional, to iPad).

Location Positioning System (GNSS)

Latitude/longitude format: Decimal degrees

Datum: WGS 84

WiFi and wireless radios

Frequency band: 2400 to 2480 MHz

Maximum transmitted radio-frequency power: Below 93mW

Environmental specification

Temperature:

- Operating: 0°C to +60°C / +32°F to +140°F
- Storage: -10°C to +60°C / +14°F to +140°F
- Recommended storage: 0 to +30°C / +32 to 86°F
- Humidity: 85%, non-condensing

Timing

Measurement time: 1 sec.

Standard delivery

- RetroSign GRX instrument
- One angle adapter (-4° ASTM, +5° CEN)
- Carrying case
- Calibration reference with DANAK calibration certificate
- Two batteries
- Battery charger (110 or 230 V)
- Quick guide
- User manual is available on www.roadsensors.com
- USB memory stick for data transfer

Add-ons

- Built-in camera for picture of sign
- Built-in barcode and QR code reader
- Built-in GPS
- Built-in wireless communication
- Instrument rotation and tilt
- Sign face direction (compass)
- MUTCD library
- Additional entrance angles of 10°, 20°, 30°, 40° & 45°
- Extension Pole Kit, 1.5-2.7 m / 4.9-8.9 feet
- App for data back-up, processing and mapping on tablet

Standard features

- Fast and simple calibration by scanning QR code
- Use of templates for uniform measurement series
- Automatic average calculation for 2 – 10 measurements
- Automatic pass/fail on colors and/or color contrast
- Sign background and legend contrast
- User ID
- Sign ID with multiple sign data entry options
- Data processing and mapping in existing software

Scalability

RetroSign GRX may be upgraded with additional features after initial purchase. The upgrade comes with a price tag, is done by scanning a QR code, and will work instantly.

Warranty

2 years

R&TTE Declaration of Conformity (DoC) and US Attestation of Conformity (AoC) can be supplied by DELTA upon request or viewed on: roadsensors.madebydelta.com/technical-background/certification

DELTA

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