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
Conspicuity tape: ECE 104

GRX-1

- Entrance / illumination angle: -4° or +5°
- Observation angle: 0.2° or 0.33°

GRX-3

- Entrance / illumination angle: -4° or +5°
- 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°
- 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 speciel measurement purposes: 10°, 15°, 20°, 30°, 40° & 45°.

For ECE 104 a multi-angle entrance angle adapter with +/- 5°, 20°, 30°, 40° and 60° angles is offered.

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

- Repeatibility: +/- 2%
- Reproducibility: +/-5%

Measurement specifications

R_A and color recognition measured by sensors
Barcodes and QR codes measured by digital camera
Field of measurement, Ø: 25 mm / 1.0 inch

Spectral responsitivity: According to ASTM E-1709 & E-2540
Range ($cd \cdot lx^{-1} \cdot m^{-2}$): 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 Council. The radio equipment directive (RED) (2014/53/EU)
Safety – article 3 (1) (a):

- Electrical safety: EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + AC2011 + A2:2013
- EMF: EN 62311:2008
- Photobiological safety: EN 62471:2008

EMC – article 3 (1) (b) EN 301 489-1 V2.1.1:2011
Radio – article 3 (2) and 3 (3):

- EN 300 328 V2.1.1:2016
- EN 303 413 V1.1.1:2017

US

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

- 47 CFR Part 15B, subpart 15.107 (class B)
- 47 CFR Part 15B, subpart 15.109 (class B)

The equipment is accredited safety test with the internationally harmonized safety standard:

- IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013

CANADA

- ICES-003:2016 (Class B)

2232.8.20

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).

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°, 15°, 20°, 30°, 40° & 45°
- ECE 104 multi-angle adapter
- Extension Pole Kit, 1.5-2.7 m / 4.9-8.9 feet

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 by supplied by DELTA upon request or viewed on: roadsensors.madebydelta.com/technical-background/certification

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