



# LTL3500

## Specifications

### Optical specifications

Field of measurement:

- Width: 50 mm / 2 inch
- Height: 180 mm / 7.1 inch

Illumination angle  $R_L$  EN 1436: 1.24°

Illumination angle  $R_L$  ASTM E 1710: 88.76°

Observation angle  $R_L$  EN 1436: 2.29°

Observation angle  $R_L$  ASTM E 1710: 1.05°

Illumination angle Qd: Diffuse

Illumination angular spread:

- Horizontal: / Vertical: 0.33 / 0.17°

Observation angular spread:  $\pm 0.17^\circ$

Equivalent observations distance: 30 m

$R_L$  range (mcd·m-2·lx-1) 0 - 4000

Qd range (mcd·m-2·lx-1) 0 - 318

### Instrument dimensions

Length: 470 mm / 18.0 inch

Width: 150 mm / 5.9 inch

Height: 280 mm / 11.0 inch

Weight: 5.6 kg / 12.3 lbs

### Construction

Structural parts: Aluminum

Housing: Polymer

Keyboard: Silicone rubber & touch screen

### Display

- 5" high brightness color touch display
- Resolution 800 x 480 pixels

### Macro camera, overhead camera

- Macro camera for close-up pictures of markings
- Overhead camera for overview of markings
- Resolution 5 megapixels (2592 x 1944 pixels)

### Regulatory compliance

*EU:*

Radio: EN 303-413 V1.1.1:2017

EMC: EN 301-489-19 V2.1.1 (2019-04)

Safety: IEC 61010-1:2010, AMD1:2016; EN 61010-1:2010+A1:2019

*USA:*

FCC: 47 CFR Part 15B (class B)

*Canada:*

ICES-003:2016 (Class B)

### Electrical characteristics

Power supply:

Battery: Rechargeable and replaceable Li-Ion 12V 3.0 Ah

Charging time: Approx. 1 hour 15 min.

External chargers:

- 230 V / 50 Hz
- 120 V / 60 Hz

### Data

Data memory: 8 GB

Data transfer: USB 2.0, Wi-Fi

Typical repeatability:  $\pm 2\%$

Typical reproducibility:  $\pm 5\%$

### 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
- Humidity: 20 - 85%, non-condensing
- Altitude: 4000 m / 13.000 feet

### Timing

Measurement time: <1 sec.

### Standards

EN 1436 ( $R_L$  & Qd), ASTM E1710 ( $R_L$ ), ASTM E2177 ( $R_L$  wet), ASTM E2302 (Qd), ASTM E2367 (night colors), ASTM 2832 (continuous wetting)

## General features

- Simultaneous  $R_L$  and Qd for dry & wet markings
- $R_L$  for continuous wetting
- Measurement time less than 1 sec for both  $R_L$  and Qd
- Measures  $R_L$  on profiled markings up to 15 mm / 0.6 inch
- Ambient temperature and humidity
- Memory capacity 8GB
- Multi-lingual
- Average calculation
- Easy-readable color touch LED display with 3 buttons
- Long-life illumination system
- USB memory stick
- Wi-Fi prepared
- Power supply, standard Bosch professional battery
- Shows and stores date, time, air temperature, and humidity
- Facility for entering and storing road ID, user ID and other measurement related data
- Data presentation in Excel
- Stray light compensated
- Single handed operation, user-friendly
- "Time for Service" indicator
- Calibration reminder
- Wet timer
- Pass-fail Indicator

## Optional features

- Qd
- Daylight contrast (requires Qd)
- Marking temperature
- Road Icon references
- GNSS positioning
  - Latitude / Longitude format: Decimal degrees
  - Datum: WGS 84
- Data presentation in Google Earth
- Nighttime color (x,y) for  $R_L$  measurements (white & yellow)
- Color Box reading
- Macro and overview cameras
- Orientation (compass, instrument tilt)
- Wi-Fi API & Web App (SW feature under development)
- User defined data linked to measurement (3rd party equipment)
- Add note to measurement
- Add roadmaking Icon to measurement
- External printer

## Standard delivery

- LTL3500 Retroreflectometer
- Hard-case transportation box
- $R_L$  calibration standard with DANAK certificate
- Qd calibration / verification marking (if Qd is ordered)
- Battery charger
- Quick guide
- USB memory stick

## Downloads

User manual to be downloaded from [www.roadsensors.com](http://www.roadsensors.com) under 'Products' and 'User manuals':

## 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](http://roadsensors.madebydelta.com/technical-background/certification) Specifications may be changed without notice.*

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