

# RMS 1200

Retroreflectometer for standard-compliant measurements of retroreflectors



We bring quality to light.



#### Key features at a glance

- ▲ **Applications:** Automotive retroreflectors, marker boards, reflectors in road construction or protective clothing for night visibility
- ▲ Compliance with CIE Publication 54.2-2001
- ▲ Fulfills all current requirements, e.g. ECE R3, R27, R150, SAE J594, ISO-EN-DIN 20471 or DIN 67520
- ▲  $V(\lambda)$  alignment  $\leq 2.0$
- ▲ Variable viewing angles from  $0.1^\circ$  to  $2^\circ$  with  $0.001^\circ$  resolution
- ▲ Display of color temperature, duty cycles and service life of the projector lamp
- ▲ Precise color temperature regulation, thus shorter burn-in-time

## 01 \ \ RMS 1200 – Accurate retroreflection values with precise color temperature control

The Optronik Line RMS 1200 from Instrument Systems measures the reflection of retroreflectors. It measures the back reflection of retroreflectors of all kinds in the automotive field and other retroreflecting materials. High-precision measurements are made in accordance with CIE Publication 54.2-2001 and reliably fulfil all current requirements, e.g. ECE R3, SAE J594, ISO-EN-DIN 20471 or DIN 67520.

Characterized by its precise color temperature control of the projector light source to standard illuminant

A. Only seconds after being switched on, the light source is stabilized and a color temperature of 2856 Kelvin is reached. As color temperature is measured and stabilized internally, the RMS 1200 delivers highly reliable test results. Uncertainty resulting from color variations of the projector light can be efficiently avoided.

The RMS 1200 is controlled by the LightCon software of an AMS goniometer or special software for applications such as ISO 20471.

#### Product certification of retroreflectors with standard compliance

The RMS 1200 is mainly used for mandatory product approval of automotive retroreflectors. In the light channel it is used together with a CIE type A goniometer of our AMS series. Measurements can thus be carried out from any angle required by the standard. The detector's tilting mechanism of the RMS 1200 ensures that the sample is always in focus. The automatic dark current

#### Typical DUTs

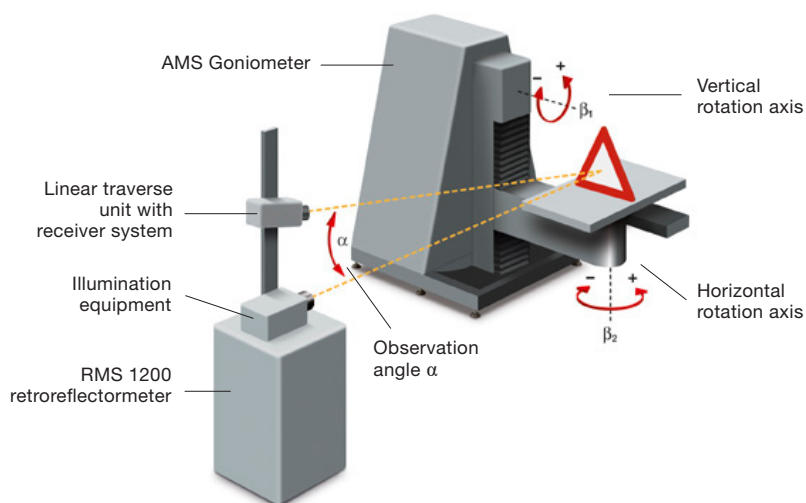
- ▲ Automotive reflex reflectors (e.g. ECE R3, SAE J594)
- ▲ Advanced warning triangles (e.g. ECE R27)
- ▲ Rear marking plates (e.g. ECE R69, ECE R70)
- ▲ Bicycle retro-reflectors (e.g. DIN 33958: 2014-12)
- ▲ Retroreflective traffic signs (e.g. DIN 67520: 2013-10)
- ▲ Retroreflective studs (e.g. EN 12899)
- ▲ Retroreflective tapes, e.g. for protective clothing (e.g. ISO 20471)



compensation guarantees that small measurement values are captured accurately and reproducibly.

The RMS 1200 is also suitable as a stand-alone measuring instrument or for special applications such as the measurement of retroreflecting foils and tapes for high visibility clothing.

RMS 1200  
functional principle



## 02 \ Turnkey solution for retroreflector testing

### Components



### Applications

#### AMS goniometer series

- ▲ Fast, robust and precise type A goniometer
- ▲ Automated measurement for compliance test according to ECE R3, R27, R150 and SAE J594
- ▲ Easy alignment by linear axes movement and alignment laser in swiveling arm
- ▲ Axes rotation extremely smooth without vibration
- ▲ Varying angle of illumination in H/V direction with 0.01° resolution

#### One-axis goniometer

- ▲ Rotation 0° - 360° for special applications
- ▲ Compliance test routine according ISO 20471 (high visibility clothing)
- ▲ Additional epsilon rotation direction for traffic retro-reflectors and retroreflective signs

#### CM 10 tristimulus colorimeter

- ▲ Measures color of reflex reflectors according to ECE R3, R27, R150
- ▲ Separate, integrated set-up available with integrated, regulated illuminant A source positioned at 12 m
- ▲ Fixture for RMS rack available for alternating use with RMS 1200 at 10 or 12 m or separately
- ▲  $V(\lambda)$  alignment  $\leq 1.5\%$  in Y-channel
- ▲ Thermostatic stabilization at 35 °C

#### Software

- ▲ LightCon software comprises regulation data base such as ECE R3, R27, R150 and SAE J594
- ▲ Modular and intuitive design
- ▲ Test report file generation with pass/fail analysis
- ▲ Retro-reflection scans with 0.001° resolution possible (stepwise)
- ▲ Upgradeable for further applications (traffic reflex reflectors, signs)
- ▲ Further application software available, e.g. ISO 20471 (high visibility clothing)

## 03 \\ Technical specifications

<b>RMS 1200 Retroreflectometer</b>	
<b>General</b>	
Test distance	Up to 100 ft (30.48 m), 15 or 10 m
Viewing angle	0.1 (at 100 ft) to 1.5°, optional 2°
Observation angle resolution	0.001°
Display range R	0.1 to 99,999 mcd/lx (display resolution in most sensitive range is 0.001 mcd/lx)
Display range R'	0.01 to 9999.9 cd/(lxm <sup>2</sup> ) for sample size 10 cm x 10 cm
<b>Light source</b>	
Special feature	Display of color temperature, duty cycles and service life of the projector lamp
<b>Projector unit</b>	
Projector aperture	0.167° (10m) / 0.1° (30.48m)
Illuminated area	Ø 200 mm (ECE) or 254 mm (10") (SAE), (optional approx. 700 mm for ECE R27 – advanced warning triangle)
Uniformity	≤ 5 % of the illumination level at the sample plane
Color temperature projector	2856 K (standard illuminant A, controlled)
<b>Sensor</b>	
V(λ) Alignment receptor	f1' ≤ 2.0% acc. to CIE 54.2-2001 and DIN 5032-7 (typ. ≤ 1.5%)
Receiver aperture	0.167° (10 m) or 1 x 0.5 inches / 25 x 12.6 mm (30.48 m)
Special features	Tilting mechanism / dark current compensation of sensor
<b>Dimension, weight, electrical data</b>	
Dimensions (H x L x W)	600 mm x 600 mm x 2450 mm or 600 mm x 600 mm x 2650 mm
Weight	75 kg

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## 04 \ Ordering information

Order number	Description
RMS1200-100	System suitable for measuring retroreflection R, e.g. according to ECE and SAE standards; comprising base frame, projector with color temperature regulation to standard illuminant A and 254 mm (10 inch) illuminated area, display unit; with movable receiver for observation angle at 10 m: 0.333° to 1.5° and at 100 ft: 0.1° to 1.5°
RMS1200-101	System suitable for measuring retroreflection R, e.g. according to ECE and SAE standards; comprising base frame, projector with color temperature regulation to standard illuminant A and 254 mm (10 inch) illuminated area, display unit; with movable receiver for observation angle 0.1° to 1.5°, measurement distance: 100 ft (30.5 m)
RMS1200-102	System suitable for measuring retroreflection R, e.g. according to ECE and SAE standards; comprising base frame, projector with color temperature regulation to standard illuminant A and 254 mm (10 inch) illuminated area, display unit; with movable receiver for observation angle 0.1° to 1.5°, measurement distance: 100 ft (30.5 m)
RMS1200-103	System suitable for measuring retroreflection R, e.g. according to ECE and SAE standards; comprising base frame, projector with color temperature regulation to standard illuminant A and 254 mm (10 inch) illuminated area, display unit; with movable receiver for observation angle: 0.2° to 2.0°, measurement distance: 15 m
RMS1200-104	System suitable for measuring retroreflection R, e.g. according to ECE and SAE standards; comprising base frame, projector with color temperature regulation to standard illuminant A and 254 mm (10 inch) illuminated area, display unit; with movable receiver for observation angle: 0.1° to 2.0° (with tilted mirror extension), measurement distance: 15 m
RMS1200-105	System suitable for measuring retroreflection R, e.g. according to ECE standards; comprising base frame, projector with color temperature regulation to standard illuminant A and illuminated area of 200 mm, display unit; with movable receiver for observation angle: 0.333° to 2.0°, measurement distance: 10 m
RMS1200-120	System for measuring color coordinates of reflex reflectors according to ECE R3; comprising base frame equipped with projector source of standard illuminant A, 254 mm (10 inch) illuminated area, color temperature control unit and display unit for color locus; incl. colorimeter head installed at fixed angular position of 0.333°, measurement distance 12 m
RMS1200-300	Extended moving unit for larger angle range 2° at 100 ft
RMS1200-301	Fixture for colorimeter head CM 10 for alternating use of colorimeter sensor
RMS1200-305	Modification of RMS projector for illuminated spot > 254 mm; for illuminating complete warning triangles (spot size on sample approx. 600 - 700 mm)
RMS1200-310	RMS-remote display in 19" chassis for control rack
RMS1200-320	Color measurement of retroreflected light; observation angle 0.333°, measuring distance 17 m; modified setup of moving unit; incl. CM10 with tristimulus color measuring head
RMS1200-500	Docking station; holding frame for reproducible positioning of the RMS 1200; also suitable for the operation of the RMS 1200 at different measuring distances
RMS1200-511	Mounting rack for RMS 1200, optical axis 1500 mm
RMS1200-512	Mounting rack for RMS 1200, optical axis 1600 mm
RMS1200-513	Mounting rack for RMS 1200, optical axis 1700 mm
RMS1200-600	One axis goniometer EPS 10 for automatic sample positioning of reflex reflectors used for road side applications; traversing range 0 to 360°, load max. 2 kg
RMS1200-601	One axis onimeter for automatic sample positioning of reflex reflectors according to ISO 20471; traversing range 0 to 360°, load max. 2 kg



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