

# LCRT-2005-S

<http://www.gigahertz-optik.de/en-us/product/LCRT-2005-S>

Product tags: VIS



# Description

## Light transmission

Light transmission is the visually sensed light permeability of materials. It is particularly important when it comes to specification of window panes on all types of vehicles, display sheets and disks as well as all the other samples whose transmission is assessed with the photometric responsivity ( $V(\lambda)$ ) of the human eye.

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## Light transmission measurement

Light transmission is a relative measurand. It describes the signal difference of the measured luminance in a geometrically defined radiation beam path. The measurements are done both without a test sample (100%) and with a test sample. The light source of the measurement device must be characterized by a spectrum that corresponds to the standard illuminant type A, C or D50. The spectral responsivity of the receiver must match that of the human eye. These properties allow ECE R43 conform measurements.

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## LCRT-2005-S light transmission measurement device

The LCRT-2005-S is elaborately designed for light transmission measurement of thin, scratched and clear samples. The D/O measurement geometry comprises of an integrating sphere light source and a luminance measurement device. The monitor detector of the light source and that of the receiver are equipped with a diode array. The spectral measurement data enables precise simulation of the standard light spectra and the photometric responsivity spectrum of the receiver. The sample is aligned in front of the light source for measurement. The degree of light transmission can thus be determined through diffuse sample illumination for thin scratched samples as well.

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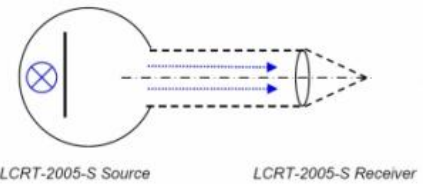
## LCRT-2005-S spectrophotometer

The LCRT-2005-S can also be used as a spectrophotometer due to its spectral measurement detectors in source and receiver. The spectral range is between 425 and 705nm.

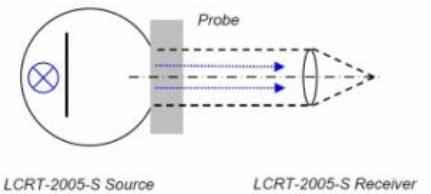
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## Measurement device for freehand measurements

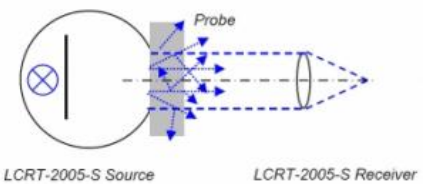
The integrating sphere light source is well guarded against shock and stains by its synthetic coating, LED lamps and the protective glass on the illumination field. In order to minimize any effects by ambient light, the measurement is performed using pulsed light. The device is also equipped with a camera to aid in alignment of the source and receiver for freehand measurements. The device can be powered using four AA batteries or via USB. A hard-top casing is also supplied for safe storage and transport of



*Measurement geometry: 100% setup*



*Measurement geometry for thin, non-scattering samples*



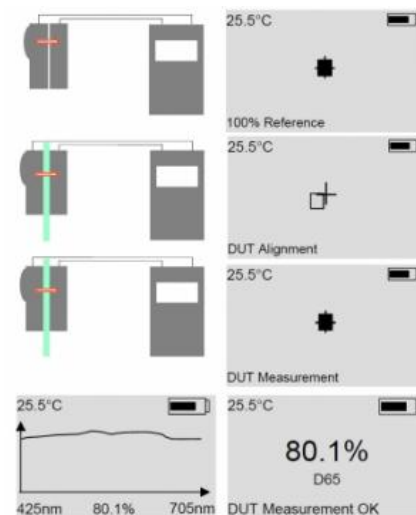
*Measurement geometry for thin, scattering samples*

the device as well as its spare batteries and accessories.

## Fast and simple freehand measurements

One of the characteristic properties of the LCRT-2005-S is its ability to easily perform a quick measurement in only a couple of minutes:

- 1) Connection of the source and receiver to the controller device
- 2) 100% adjustment measurement
- 3) Alignment to the test sample
- 4) Automatic start of the measurement
- 5) Display of the measurement values



*Freehand light transmission measurement: 1) 100% adjustment 2) sample alignment (DUT) 3) automatic measurement start upon setup, 4) Display of the measurement values*

## USB interface with readout software

The USB interface enables data readout and power supply. The software delivered with the device can be used for measurement data readout.

## Traceable measurements

Two transmission standards with 70% and 80% light transmittance are offered for device matching in applications where traceable measurement values are required.

## Specifications

General	
Short description	Mobile measuring Instrument for light transmission.
Main features	Spectral measuring method. Compact source and receiver. Build in camera for receiver to source alignment support. Controller with battery (four AA) or USB power operation. Puls modulated LED lamp for measurements in ambient light conditions.
Measurement range	Spectral range: 425 nm to 705 nm Spectral resolution: 5 nm Transmission range: 5 % to 100 % Measurement beam diameter: 6.6 mm Illumination: A, C, D65 Detection: Spectral Photometric, Spectral Radiometric
typical applications	Measurement of the light transmission of automotive and all other vehicles front and side windows. Measurement of the spectral transmission of thin films and thin plates.
Calibration	Relative measurement methode with 100 % reference adjustment. Optional calibration with 70 % or 80 % calibration standards.
Product	
Measurement geometry	D/0 geometry; measurement of the luminance ratio with a diffuse light source as per CIE 130 & DIN 5036.

Beam diameter	6.6 mm at contact measurement
Light Source	Integrating sphere light source with a 20 mm illumination field; LED lamps; diode array monitor detector. Simulation of the standard illuminants type A, D65 and D50.
Sensor	Diode array detector with radiance lens. Depolarizer for measurement of polarized samples. Simulation of photometric responsivity. Digital camera for aid in freehand setup of source and receiver.
spectral range	425 nm to 705 nm
Measurement range	5 % to 100 % transmission for a color-neutral transmission spectrum
typical Measurement uncertainty	± 1 % absolute
Data Resolution	0.1 %
Calibration	Relative measurements after performing 100% match against air. Traceable measurements after matching with calibrated standard filters.

#### Source

Light Source	White LEDs in pulse mode, usable wavelength range: 425 nm to 705 nm
Monitor detector	array spectrometer based on a 256 pixel diode
Connector	Length 1.5m Mini DIN plug RS232 and voltage supply
Housing	Aluminium profile with plastic caps Threaded bores for mounting
Dimensions	160 mm x 45 (60) mm x 85 mm
Weight	450 g
Light Source	Integrating sphere with synthetic ODM98 coating. 20 mm illumination field diameter with homogenous luminance distribution (Lambertian radiator). Illumination field equipped with a protective shield.

#### Receiver



Sensor	256 pixel diode array spectrometer with an achromatically corrected lens. Implemented depolarizer for measurement of polarized samples.
Measurement beam geometry	Measurement field angle - 0.38 ° Sample alignment 0 ° illumination field diameter by contact measurement - 6.6 mm, in 1 m measurement distance 12.6 mm
Dimensions	160 mm x 45 mm x 85 mm
Weight	400 g

#### Controller

Source and receiver connector	Two mini DIN plug connections
Display	Monochromatic display with backlight that can be switched on/off
Parameter adjustment	Menu operated saving of the last used settings four control buttons

Interface	USB
Power Supply	4 x AA batteries alternative 4 x AA batteries with external charger USB
Dimensions	230 mm x 72 (115) mm x 35 (50) mm
Weight	400 g
<b>Miscellaneous</b>	
temperature range	10 °C to 40 °C
Humidity	Above the saturation temperature

## Configurable with

Produktname	Product Image	Description	Show product
B2S-40-TRTH		Rail-bench to extend the LCRT-2005-S use to evaluate thin samples transmission by diffuse and regular illumination.  Features: stable 1m length rail bench with stand for source and receiver. Carriage with sample holder.	<a href="http://www.gigahertz-optik.de/en-us/product/LCRT-2005-SuB2S-40-TRTH">http://www.gigahertz-optik.de/en-us/product/LCRT-2005-SuB2S-40-TRTH</a>
PMS-RIT		Stand to extend the LCRT-2005-S use to measure the regular (in-line) transmission of thick samples up to 100mm thickness.  Features: stable stand with mount for source and receiver. Sample table.	<a href="http://www.gigahertz-optik.de/en-us/product/PMS-RIT_LCRT-2005-S">http://www.gigahertz-optik.de/en-us/product/PMS-RIT_LCRT-2005-S</a>

## Purchasing information

Article-Nr	Modell	Description
<b>Product</b>		
15296702	LCRT-2005-S	Measurement device, 100% adjustment support plate, setup aid, hard case, software CD, handbook
<b>Accessories</b>		
15297874	LCRT-2005-S-BN-T70	Spectral calibration standard with 70% light transmission; calibration certificate
15297875	LCRT-2005-S-BN-T80	Spectral calibration standard with 80% light transmission; calibration certificate
15305907	LCRT-2005-S-BN-T100	100% alignment plate
15298554	LCRT-2005-S-Z01	Bench-top stand for source and receiver
15298640	B2S-40-TRTH	Optical bench with adjustable sample holder

**Article-Nr****Modell****Description**

15297916

PMS-RIT

Bench-top stand for source and receiver