LCRT-2005H-S

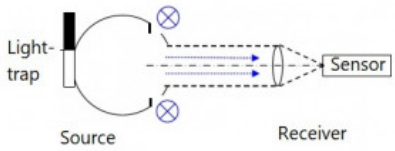
Product tags: VIS , Handheld device

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(λ) of the human eye.

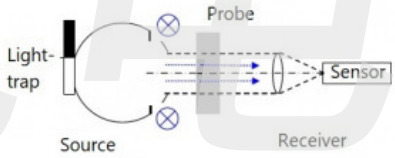
Light transmission is a relative measurement. It describes the signal difference of the measured luminance in a geometrically defined radiation beam path. The measurements are done both without a test sample (100%) and with a test sample. The light source of the measurement device is characterized by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



Measurement geometry: 100% setup, no light trap (light trap insert for haze measurement)

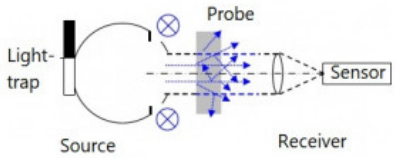
Description of the LCRT-2005H-S Measurement Device / Transmission Meter

The LCRT-2005H-S is elaborately designed for light transmission measurement of thin, scratched and clear samples. The d/0° 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 both equipped with a diode array spectrometer. The spectral measurement data enables precise simulation of the required standard source 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. A manually selected light trap is implemented for haze measurements. Multiple LEDs are used in order to cover a spectral range of 380 nm to 780 nm.



Measurement geometry for thin, non-scattering samples

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 the device as well as its spare batteries and accessories.



Measurement geometry for thin, scattering samples

Haze Measurement Device / Haze Meter

The LCRT-2005H-S incorporates a manually selected light trap that allows the measurement of haze according to ASTM D1003−13. The light trap

installed allows precise measurements due to an innovative light trap design usable for mobile small devices like the LCRT-2005H-S. The meter supports the user during the measurement by intuitive display commands.

Usage as Spectrophotometer

The LCRT-2005H-S can also be used as a spectrophotometer due to its spectral measurement detectors implemented in source and receiver. The spectral range of the spectrophotometer is given between 380 nm and 780 nm.

Fast and Simple Freehand Measurements

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

Transmission Measurement Procedure:

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

Haze Measurement Procedure:

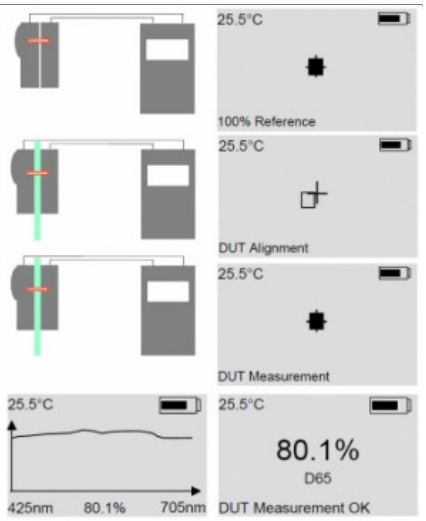
1) Connection of the source and receiver to the controller device
2) 100% adjustment measurement with and without light trap
3) Alignment to the test sample
4) Start of the measurements (with and without light trap)
5) Display of the measurement values

USB Interface and 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 / Traceable Transmission Standards

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



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

Specifications

General	
Short description	Mobile measuring Instrument for light transmission and haze measurement.

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: 380 nm to 780 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 and Haze of automotive and all other vehicles front and side windows. Measurement of the spectral transmission of thin films and thin plates.
Calibration	Relative measurement method 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. Haze measurement according to ASTM D1003−13
General	System based on controller, receiver and source. The controller controls both source and receiver. Both are therefore connected with mini-DIN connector. Via USB the controller and thus the system can be controlled from the PC if necessary. It is designed for manual operation. The parallel beam of the source is received by the receiver. Both have correction capabilities. The light trap in the source allows haze measurements. The different LEDs cover a spectral range from 380 nm to 780 nm.
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	380 nm to 780 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	
Beam diameter	6.6 mm at contact measurement
Light Source	Blue, White and NIR LEDs in pulse mode, usable wavelength range: 380 nm to 780 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 (75) mm x 85 mm
Weight	500 g

Design	Integrating sphere with synthetic ODM98 coating. 20 mm illumination field diameter with homogenous luminance distribution (lambertian radiator). Illumination field equipped with a protective shield. Light trap for haze measurement.
Receiver	
Sensor	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
Miscellaneous	
Temperature range	10 °C to 40 °C
Humidity	Above the saturation temperature

Downloads

Type	Description	File-Type
LCRT-2005-S	LCRT-2005-S Brochure and applications	pdf

Configurable with

Product Name	Product Image	Description
B2S-40-TRTH		Rail-bench to extend the LCRT-2005H-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.
PMS-RIT		Stand to extend the LCRT-2005H-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.

Purchasing information

Article-Nr	Modell	Description
Product		
15312669	LCRT-2005H-S	Measurement device, 100% adjustment support plate, setup aid, hard case, software CD, handbook
Software		
15312082	S-SDK-LCRT2005	Software development kit for the implementation of an LCRT-2005-S device into custom software.
Accessories		
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
15297916	PMS-RIT	Bench-top stand for source and receiver