

# LCRT-2005-S+850

Product tags: VIS , NIR



## Description

### Light transmission and spectral transmission

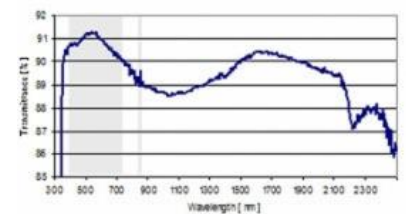
Light transmission is the visually sensed light permeability of materials. NIR transmission is a physical measurand without actinic effect on the measurement values. Light transmission is particularly important when it comes to specification of window panes on all types of vehicles and buildings whose transmission is assessed with the photometric responsivity ( $V(\lambda)$ ) of the human eye. In connection with thermal insulation screens, solar cell windows transmission in the NIR spectral range can also be of great importance.



*Light transmission measurement of thin samples*

### Transmission and light transmission measurement

Transmission is a relative measurand. It describes the signal difference of the measured luminous intensity in a geometrically defined radiation beam. The measurements are done both without a test sample (100%) and with a test sample.



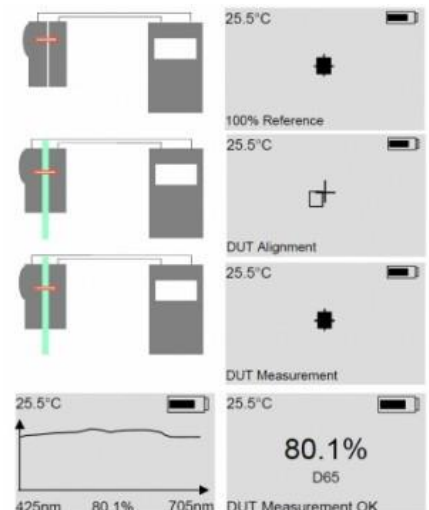
### LCRT-2005-S+850 light transmission measurement device

The LCRT-2005-S+850 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 transmittance can thus be determined through diffuse sample illumination also for thin diffuse scattering samples.

*Typical spectral transmission of a float glass pane with characteristic NIR absorbance effected by iron oxide together with the spectral measurement range of the LCRT-2005-S+850*

### LCRT-2005-S+850 spectrophotometer

The LCRT-2005-S+850 can also be used as a spectrophotometer due to its spectral measurement detectors in source and receiver. The spectral range is between 425 nm and 705 nm. An extra NIR LED in the light source and a silicon photodiode in the receiver make it possible to measure the transmission at 850 nm.



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

### 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 the device as well as its spare batteries and accessories.

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## Fast and safe freehand measurements

One of the characteristic properties of the LCRT-2005-S+850 is its ability to easily perform fast measurement in only a couple of minutes:

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

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## 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.

## Specifications



### General

Short description	Mobile measuring Instrument for light transmission and spectral transmission at 850 nm.
Main features	Spectral measuring method. Additional NIR LED at 850 nm. 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 and at 850 nm Spectral resolution: 5 nm (405 nm to 705 nm), NIR LED (850 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 visible spectral transmission and NIR transmission at 850 nm of glas with iron oxide absorbance in the longer wavelength range e.g. in solar cell protection windwos.
Calibration	Realative measurement methode with 100 % reference adjustment.
<b>Product</b>	
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 20mm illumination field  LED light source  diode array monitor detector  Simulation of the standard illuminants type A, C and D65
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 + 850nm
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.
<b>Source</b>	
Light Source	White LEDs in pulse mode, usable wavelength range: 425 n to 705 nm
Monitor detector	256 pixel diode array spectrometer
Connector	Length 1.5 m  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 with a protective shield.
<b>Receiver</b>	
Sensor	256 pixel diode array spectrometer and Si-Fotodiode for 850 nm with an achromatically corrected lens. 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
Interface	USB
Connection cable	Length 1.5 m  Mini DIN plug  RS232 and voltage supply
Weight	400 g
<b>Controller</b>	
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
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 (< 85 % on the measurement device)

## Configurable with

Product Name	Product Image	Description
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.
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.

## Purchasing information

Article-No.	Model	Description
<b>Product</b>		
101426-2	LCRT-2005-S+850	Similar to the LCRT-2005-S but with an extra wavelength support point at 850nm
<b>Software</b>		
15312082	S-SDK-LCRT2005	Software development kit for the implementation of an LCRT-2005-S device into custom software.
<b>Accessories</b>		
15305907	LCRT-2005-S-BN-T100	100% alignment plate
15298554	LCRT-2005-S-Z01	Bench-top stand for source and receiver
<b>Article-No.</b>		
15298640	B2S-40-TRTH	Optical bench with adjustable sample holder
15297916	PMS-RIT	Bench-top stand for source and receiver