

- © Hand Held Single Channel Irradiance Meter
- © Signal Range 0.1 mW/cm² to 40.000 mW/cm²
- © UV-A, BLUE and Broadband UV Spectral Responses
- © Low Profile - 8 mm High - Flexible and Rigid Detector Heads
- © High Operating Temperature to 100 °C
- © Cosine Corrected Field of View
- © Power Density Measurement Mode with Snapshot Hold Function
- © Dose Measurement Mode
- © Easy to Use
- © ISO/IEC/EN 17025 Traceable Calibration
- © RS232 Interface



UV Radiation Intensity

UV curing is a process in which photocurable chemicals applied to substrates are irradiated with high energy UV or Visible radiation for curing. This energy accelerates polymerization (cross-linking) and consequently the hardening or drying process. The irradiated energy needs to be controlled, since too low a dose will not cure the product, whereas too high a dose may damage or dry-out the surface layer of glues.

UV curing technology is used in the manufacturing process of many products we use everyday. Some examples are CD's, wood and tile flooring, magazine covers and inks on cans & other packaging.

Within the context of "Total Quality Management" it is appropriate to regularly check the proportion of radiation from UV sources that effects the polymerization process. The intense UV radiation generated by these sources combined in some cases with high heat levels, can lead to rapid degradation and large drift factors in conventionally constructed UV measurement de-

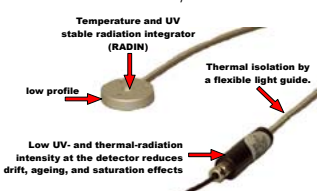
vices. Unreliable process control measurements can result.

X9₂ Meter

Besides it's precision measurement capability the X9₂ ('Xninetwo') meter's most outstanding feature is its easy handling. To measure, the user simply switches on the meter and selects either the CW (W/cm²) or Dose (J/cm²) mode. The LCD characters are 9 mm high for easy viewing. The X9₂ is a compact handheld battery operated instrument.

Large Dynamic Range:

A novel detector design in combination with 7 decade linear electronics allows the X9₂ to offer a wide measurement range from 5 to 40.000 mW/cm² with 0.1



mW/cm² resolution!

Direct intense ultraviolet and heat radiation are absorbed and attenuated by a passive and therefore long term stable RADIN

sensor element. The filter and photodiode, which are kept outside of the hot zone, only receive attenuated radiation passing through the RADIN at the end of the UV light guide.

Two different style detectors (see chapter detector heads) are available:

RCH-0 Flexible Light-guide

The RCH-0 series heads are designed with a flexible 50 cm (20 in.) long light-guide protected by flexible stainless steel sheathing.

RCH-1 Rigid Light-guide

The RCH-1 series heads are designed with a rigid 22 cm (8.7 in.) light-guide protected by a rigid stainless steel tube.



Traceable Calibration

Calibration is traceable to the ISO EN 17025 accredited part of Gigahertz-Optik's Calibration Laboratory for Optical Radiation Quantities.

Custom Labeling:

All meters in the X9 family are ready for custom design and labeling. Customization may include the meter front label, function/mode set-up, detector heads, manuals and calibration certificates. Contact the factory for more details.

*) Lumatec-Deisenhofen Germany



Flood and Spot Sources:

A large dynamic range plus optional adapters allow the X9₂ to measure flood and spot sources. The low 8 mm (0.32 in.) height of the sensor element enables irradiance measurements very close to the target surface. A 9 mm dia. (0.35 in.) measurement aperture accepts adapters for LUMATEC[®] 3, 5 and 8 mm dia. light-guides.

UVA, BLUE and UV Broadband Spectral Responses

Both detector models are available for different wavelength ranges corresponding to various photo-initiator and curing technologies.



The RCH-0 detectors with flexible light-guide are designed to measure in remote inaccessible locations

Operation

The X9₂ is simple to operate. To measure, connect the detector and switch on the meter.

CW Measurement

CW mode is used to measure continuous DC or AC signals.

Dose Measurement

Measurement values are accumulated at a logger rate of 1 s and displayed as a dose. The measurement is manually started and stopped.

Stop/Run Function

Current reading can be 'frozen' by pressing 'stop' button.

X9₂ Specification & Ordering InformationSpecification: X9₂ Meter

Signal Input	
Detector Input	Photocurrent to voltage converter amplifier with following voltage to voltage amplifier (x10). 7 decade stepped gain ranges with max. gain signal values from 200.0 μ A to 200.0 pA. Automatic range switching. 12 bit ADC with up to 14 bits at longer integration times.
Signal Processing	A/D converter with 20 ms time interval. 500 ms integration through averaging of multiple measurements.
Frequency Range	Signal conversion from 0.166 Hz to >300 MHz. .
Detector Connector	9 pin MDSM9 socket.

Range Specifications

Range (A/V)	Max. Input Value	Slew-Rate (10 - 90%)	Error (with offset compensation) 1 year, 23°C \pm 5°C \pm (% of reading + % of range),	Permitted Detector Capacitance
1x10 ⁻⁴	200.0 μ A	30 ms	0.2 %* + 0.05 %	2 nF
1x10 ⁻⁵	20,00 μ A	30 ms	0.2 %* + 0.05 %	2 nF
1x10 ⁻⁶	2,000 μ A	30 ms	0.2 %* + 0.05 %	2 nF
1x10 ⁻⁷	200,0 A	30 ms	0.2 %* + 0.05 %	10 nF
1x10 ⁻⁸	20,00 nA	30 ms	0.2 %* + 0.05 %	10 nF
1x10 ⁻⁹	2,000 nA	30 ms	0.2 %* + 0.05 %	10 nF
1x10 ⁻¹⁰	200,0 pA	30 ms	0.2 %* + 0.05 %	10 nF

Function

Parameter Settings	Retention of the last settings in continuous memory. 3 function buttons.
Measurement Quantity	Ampere calibrated with DKD calibrated current source. Current signal multiplied with calibration correction factor to display irradiance in mW/cm ² . Calibration factors for full aperture and 3, 5 and 8 mm light guide adapters selected in menu mode. Calibration data stored in calibration storage of the meter.

General

Display	6 character LCD. Character height 9 mm. Indication of measurement quantities lx and cd/m ² , battery low, peak, stop
Operating Temperature	5 to 40 °C (41 to 104 ° F) (75 % rel. H, non-condensing). Storage Temperature: 0 to 50°C (32 to 122 ° F).
Dimensions/Weight	120 x 65 x 22 mm / 150 g (4.7 x 2.6 x 0.9 in / 0.33 lb).
Power	9 V one-piece battery. Operation time about 100 h. Operation from a AC plug-in power supply 230V/50 Hz on option, erases battery operation.

Interface

RS232	9600 Baud, 8 8D, 1S,N. 8 pin plug Hirose, type 3260-8S1. Power supply operation recommended for remote control.
-------	---

X9₂ with RCH-0 or RCH-1 Detector Head:

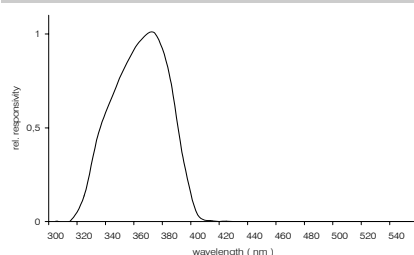
UVA Detector	Max. irradiance	35,000 mW/cm ²	Max. resolution	0.1 mW/cm ²
BLUE Detector	Max. irradiance	35,000 mW/cm ²	Max. resolution	0.1 mW/cm ²
Broadband UV Detector	Max. irradiance	35,000 mW/cm ²	Max. resolution	0.1 mW/cm ²
RCH-0	Flexible light-guide.		Light-guide length	50 cm (20 in)
RCH-1	Rigid light-guide		Light-guide length	22 cm (8.6 in)
Temperature Range	RADIN Sensor	100 °C (212°F)	Detector	5-40°C (41 - 104°F)
Size	RADIN Sensor	8 mm x 37 mm Ø	Complete length	100 cm (39 in)

Ordering Information

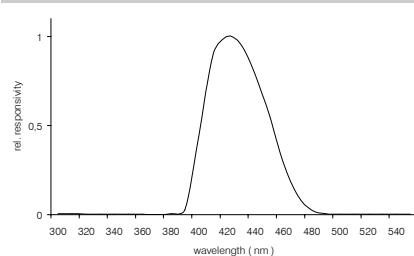
X9 2	Optometer with handbook and battery. Detector calibration data stored in memory
RCH-008-4	Low-profile UVA detector with flexible light-guide. Calibration certificate. ITT-type connector
RCH-009-4	Low-profile BLUE detector with flexible light-guide. Calibration certificate. ITT-type connector
RCH-006-4	Low-profile UV-broadband detector with flexible light-guide. Calibration certificate. ITT-type connector
RCH-108-4	Low-profile UVA detector with rigid light-guide. Calibration certificate. ITT-type connector
RCH-109-4	Low-profile BLUE detector with rigid light-guide. Calibration certificate. ITT-type connector
RCH-106-4	Low-profile UV-broadband detector with rigid light-guide. Calibration certificate. ITT-type connector
RCH-Z-01	8 mm type Lumatec Light-guide Adapter. Calibration data stored in meter memory
RCH-Z-02	5 mm type Lumatec Light-guide Adapter. Calibration data stored in meter memory
RCH-Z-03	3 mm type Lumatec Light-guide Adapter. Calibration data stored in meter memory
X9Z-01	RS232 interface cable to connect the X9 meter with 9PIN SUB-D PC standard socket
X9Z-02	External AC power unit for the X9 meter including meter modification (cancels battery operation)
BHO-05	Hard case to carry and store the X9 2 and one RCH-0 or one RCH-1 detector

Spectral Sensitivity:

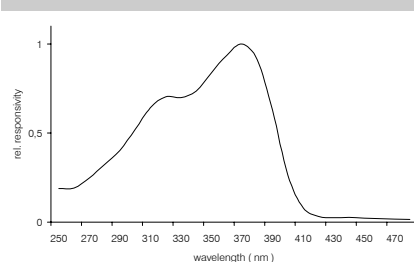
UVA (08)



BLUE (09)



Broadband UV (06)



Light Guide adapter

Light Guide Adapter Dimension (mm)

Model:	Eff. size	d1	d2	h
RCH-Z-01	8 mm	10h7	9	10
RCH-Z-02	5 mm	7h7	6	10
RCH-Z-03	3 mm	5h7	4	10