

LaserDec CL



Laser detection in a new dimension  
CO<sub>2</sub>-Laser Beam Profiler

## TABLE OF CONTENTS

---

### PRODUCT DESCRIPTION

LASERDEC CL200 / CL200HP

TECHNICAL DATA

DIMENSIONS

LASERDEC CL500 / CL500HP

TECHNICAL DATA

DIMENSIONS

### ACCESSORIES

ATTENUATION UNIT 0°

ATTENUATION UNIT 90°

BEAM REDUCER

IR MICROSCOPE OBJECTIVE

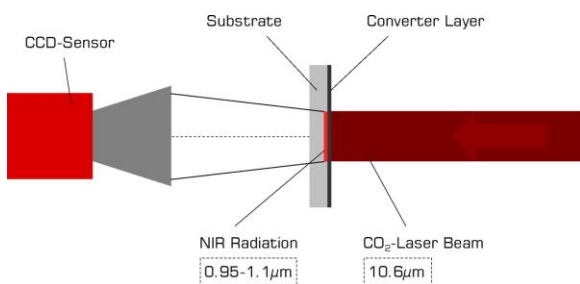
BEAM PROFILING SOFTWARE RAYCI



## LaserDec CL - Product Description -

The high performance LaserDec system is based on industry's unique imaging technique. It is designed for monitoring high-power CO<sub>2</sub>-lasers in best performance. Thanks to its high resolution and its incomparable real-time capabilities, this highly efficient beam profiler is optimized for laser beam analysis of continuous wave (cw) and pulsed laser systems.

### TECHNICAL PRINCIPAL



The LaserDec system ensures beam profiling:

- By high frame rates and high resolution,
- Without optical components in the beam path,
- Without scanning techniques, fluorescent materials or toxic fumes through acrylic mode burns.

The LaserDec supports the ultra-fast FireWire IEEE 1394a/b interface with data transfer rates up to 800 Mbit/s. The plug and play design facilitates easy and flexible integration and operation.

The compact and portable LaserDec is designed to be used in a variety of applications in industry, science, research and development, including:

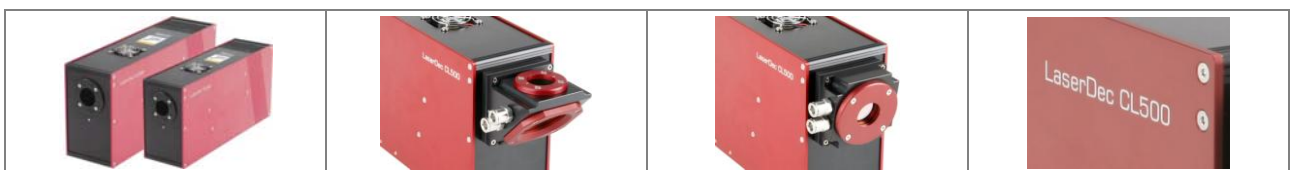
- Laser beam analysis of cw and pulsed lasers,
- Quick control of laser modes and adjustment errors,
- Test equipment for scientific research,
- Near-Field and Far-Field analyses of lasers.

The enhancement of product quality, process reliability and efficiency are just a few of the many benefits of CINOGY's unique beam profiling system.

The LaserDec system includes the specifically designed analysis software, RayCi, which supports XP / Vista / Windows 7 operating systems. Its sophisticated software architecture opens up new opportunities in laser beam analysis according to ISO standards.

### ACCESSORIES

- Attenuation Units
- Beam Reducer / Beam Expander
- IR Microscope Objective
- FireWire Components
- Trigger Device
- Ect.





## LaserDec CL - Technical Data -

	<b>CL200</b>	<b>CL200 HP</b>	<b>CL500</b>	<b>CL500 HP</b>
<b>IMAGE CONVERTER</b>	<i>Standard</i>	<i>High Performance</i>	<i>Standard</i>	<i>High Performance</i>
Spectral sensitivity:	optimized for 10.6µm	optimized for 10.6µm	optimized for 10.6µm	optimized for 10.6µm
Clear aperture:	Ø=20mm	Ø=20mm	Ø=30mm	Ø=30mm
Laser beam diameter (1/e <sup>2</sup> ):	1mm - 10mm	1mm - 10mm	1mm - 15mm	1mm - 15mm
Intensity range*:	10W/cm <sup>2</sup> - 1.000W/cm <sup>2</sup>	20W/cm <sup>2</sup> - 2.000W/cm <sup>2</sup>	10W/cm <sup>2</sup> - 1.000W/cm <sup>2</sup>	20W/cm <sup>2</sup> - 2.000W/cm <sup>2</sup>
Input power (max):	200W	200W	500W	500W
With attenuation unit 0°:	up to 2kW	up to 2kW	up to 2kW	up to 2kW
With attenuation unit 90°:	up to 2.5kW	up to 2.5kW	up to 3kW	up to 3kW
Effective pixel size:	x=78µm / y=73µm	x=44µm / y=42µm*	x=110µm / y=102µm	x=65µm / y=63µm*
<b>CAMERA FEATURES</b>				
Sensor:	CCD	CCD	CCD	CCD
Resolution:	367 x 288pixel	640 x 482pixel*	367 x 288pixel	640 x 482pixel*
Bit depth (output):	8Bit	14Bit	8Bit	14Bit
Frame rate:	up to 50Hz	up to 40Hz*	up to 50Hz	up to 40Hz*
Interface:	FireWire (IEEE1394a)	FireWire (IEEE1394b)	FireWire (IEEE1394a)	FireWire (IEEE1394b)
Mode:	cw or pulsed	cw or pulsed	cw or pulsed	cw or pulsed
<b>SPECIFICATIONS</b>				
Mechanical dimensions (W x H x L):	298mm x 141mm x 76mm	298mm x 141mm x 76mm	340mm x 165mm x 92mm	340mm x 165mm x 92mm
Weight:	2.6kg	2.6kg	3.3kg	3.4kg
Electrical requirements:	AC120V / 240V; 48 - 63Hz; 320W	AC120V / 240V; 48 - 63Hz; 320W	AC120V / 240V; 48 - 63Hz; 570W	AC120V / 240V; 48 - 63Hz; 570W
Storage temperature**:	0°C...+60°C	0°C...+60°C	0°C...+60°C	0°C...+60°C
Operating temperature**:	+5°C...+35°C	+5°C...+35°C	+5°C...+35°C	+5°C...+35°C
Humidity:	20%...80%	20%...80%	20%...80%	20%...80%
Regulations:	CE, RoHs	CE, RoHs	CE, RoHs	CE, RoHs

\* different parameters on request

\*\* without condensation

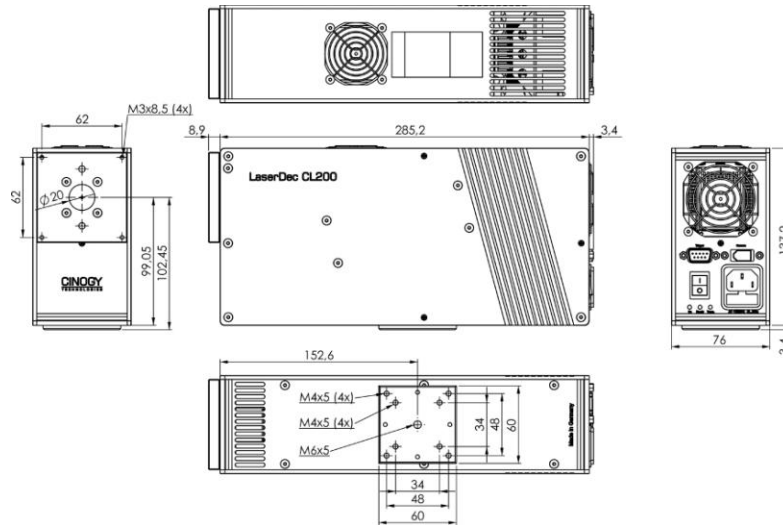
Design and specification of the described product(s) are subject to change without notice.



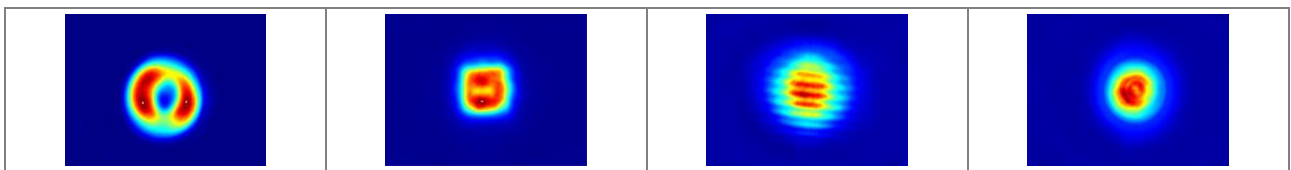
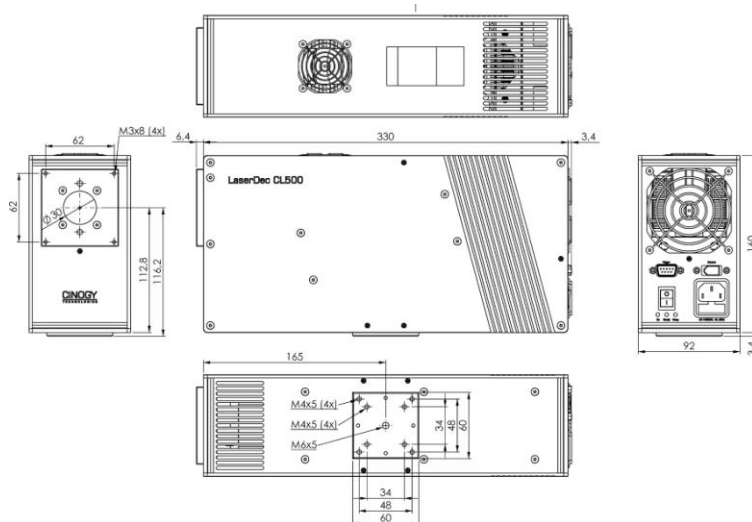


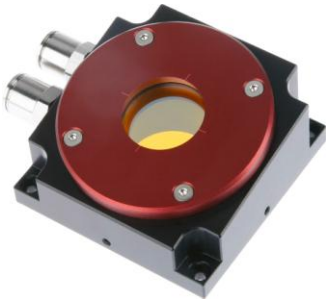
## LaserDec CL - Dimensions -

### LaserDec CL200 / CL200 HP



### LaserDec CL500 / CL500 HP





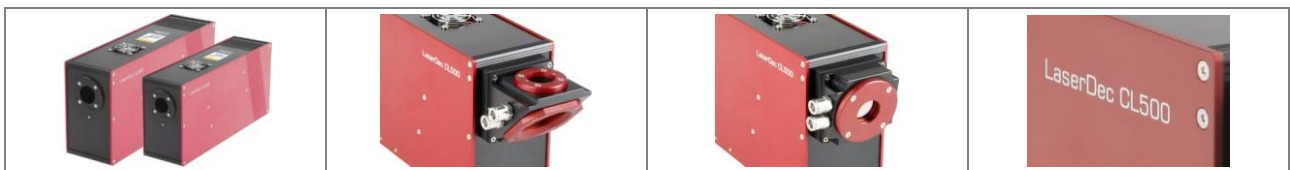
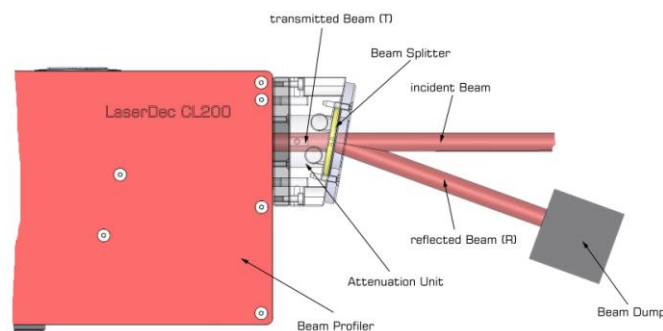
## Attenuation Unit 0° - Technical Data -

The attenuation unit is based on a zinc selenide (ZnSe) beam splitter and can be mounted in four positions on the LaserDec aperture. It is designed for a 10° angle of incidence and can be used up to intensities of 4kW/cm<sup>2</sup>. The absorbed heat is dissipated by cooling water whereby thermal lens effects are eliminated. The water-cooling allows the utilization of lasers up to powers of 2kW. To avoid interference patterns the beam splitter is designed as wedge angle.

	AU-05-0	AU-10-0	AU-15-0	AU-20-0
Transmission rates*:	T=5%	T=10%	T=15%	T=20%
Angle of incidence:	10°	10°	10°	10°
Aperture:	Ø=25mm	Ø=25mm	Ø=25mm	Ø=25mm
Laser beam diameter (1/e <sup>2</sup> ) LaserDec CL200:	max. 10mm	max. 10mm	max. 10mm	max. 10mm
Laser beam diameter (1/e <sup>2</sup> ) LaserDec CL500:	max. 15mm	max. 15mm	max. 15mm	max. 15mm
Wedge angle:	6-10min	6-10min	6-10min	6-10min
Surface:	S1=plan - 95%R S2=plan - AR	S1=plan - 90%R S2=plan - AR	S1=plan - 85%R S2=plan - AR	S1=plan - 80%R S2=plan - AR
Intensity (I <sub>max</sub> ):	4kW/cm <sup>2</sup>	4kW/cm <sup>2</sup>	4kW/cm <sup>2</sup>	4kW/cm <sup>2</sup>
Power (P <sub>max</sub> ) LaserDec CL200:	2kW	2kW	1.5kW	1kW
Power (P <sub>max</sub> ) LaserDec CL500:	2kW	2kW	2kW	2kW
Water-cooling:	2l/min / 2bar	2l/min / 2bar	2l/min / 2bar	2l/min / 2bar
Hose diameter:	OD=8mm	OD=8mm	OD=8mm	OD=8mm

\* other transmission rates on request

Design and specification of the described product(s) are subject to change without notice.



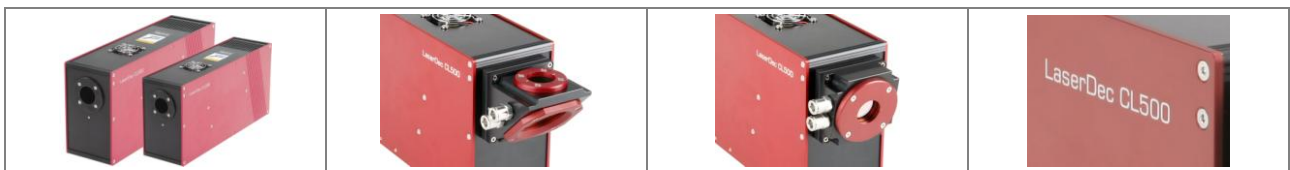
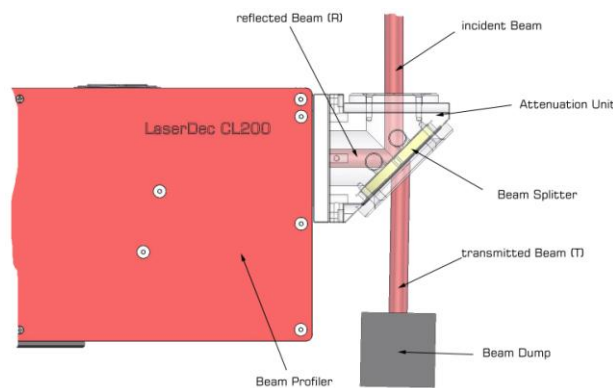


## Attenuation Unit 90° - Technical Data -

The attenuation unit is based on a zinc selenide (ZnSe) beam splitter and can be mounted in four positions on the LaserDec aperture. It is designed for a 45° angle of incidence and can be used up to intensities of 5kW/cm<sup>2</sup>. The absorbed heat is dissipated by cooling water whereby thermal lens effects are eliminated. The water-cooling allows the utilization of lasers up to powers of 3kW. To avoid interference patterns the beam splitter is designed as wedge angle.

	<b>Polarization-dependent</b>	<b>Polarization-independent</b>	
	<b>AU-SP-90</b>	<b>AU-33-90</b>	<b>AU-50-90</b>
Reflection rates:	R <sub>S</sub> =28% / R <sub>P</sub> =7.8%	R=33.3%	R=50%
Angle of incidence:	45°	45°	45°
Aperture:	Ø=26mm	Ø=26mm	Ø=26mm
Laser beam diameter (1/e <sup>2</sup> ) LaserDec CL200:	max. 10mm	max. 10mm	max. 10mm
Laser beam diameter (1/e <sup>2</sup> ) LaserDec CL500:	max. 15mm	max. 15mm	max. 15mm
Wedge angle:	1°	6-10min	6-10min
Surface:	S1=plan - uncoated S2=plan - AR	S1=plan - 33.3%R S2=plan - AR	S1=plan - 50%R S2=plan - AR
Intensity (I <sub>max</sub> ):	5kW/cm <sup>2</sup>	3kW/cm <sup>2</sup>	3kW/cm <sup>2</sup>
Power (P <sub>max</sub> ) LaserDec CL200:	700W (R <sub>S</sub> ) / 2.5kW (R <sub>P</sub> )	600W	400W
Power (P <sub>max</sub> ) LaserDec CL500:	1.7kW (R <sub>S</sub> ) / 3kW (R <sub>P</sub> )	1.5kW	1kW
Water-cooling:	2l/min / 2bar	2l/min / 2bar	2l/min / 2bar
Hose diameter:	OD=8mm	OD=8mm	OD=8mm

Design and specification of the described product(s) are subject to change without notice.



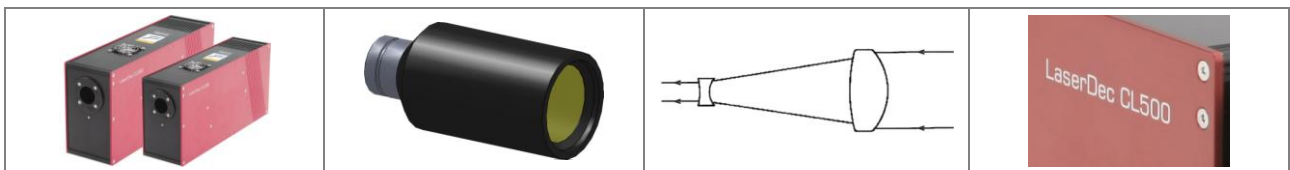
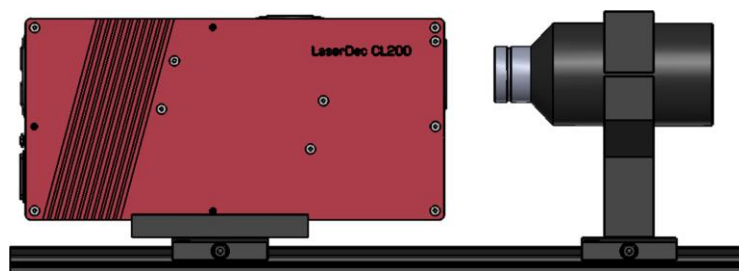


## Beam Reducer - Technical Data -

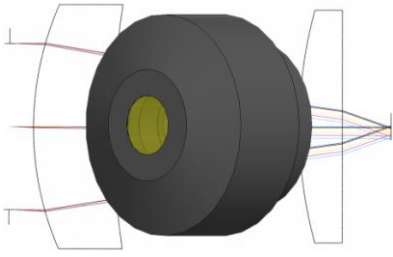
The beam reducers are based on zinc selenide (ZnSe) lens elements with adjustable lens spacing. The large input aperture allows beam profiling of lasers with diameters up to 40mm with CINOGY's LaserDec systems. A high transmission rate >97% and a low wavefront distortion <1/4 Wave ensure beam reducing without loss. The beam reducers can be used up to intensities of 20kW/cm<sup>2</sup> for pulse wave and 1kW/cm<sup>2</sup> for continuous wave. They have one positive input lens and one negative output lens (Galilean telescope).

	BR-25-2x	BR-50-2x	BR-50-5x	BR-75-5x
Reduction ratio:	2x	2x	5x	5x
Input aperture:	25mm	50mm	50mm	75mm
Output aperture:	12.5mm	25mm	10mm	14.4mm
Beam diameter:	max. 13mm	max. 26mm	max. 26mm	max. 40mm
Intensity (I <sub>max</sub> ) CL200:	1kW/cm <sup>2</sup>	-	400W/cm <sup>2</sup>	400W/cm <sup>2</sup>
Intensity (I <sub>max</sub> ) CL500:	-	1kW/cm <sup>2</sup>	400W/cm <sup>2</sup>	400W/cm <sup>2</sup>
Coating damage threshold:	100MW/cm <sup>2</sup>	100MW/cm <sup>2</sup>	100MW/cm <sup>2</sup>	100MW/cm <sup>2</sup>
Dimensions (O.D. x L):	38.1mm x 83mm	69.9mm x 147mm	69.9mm x 147mm	85.7mm x 230mm

Design and specification of the described product(s) are subject to change without notice.







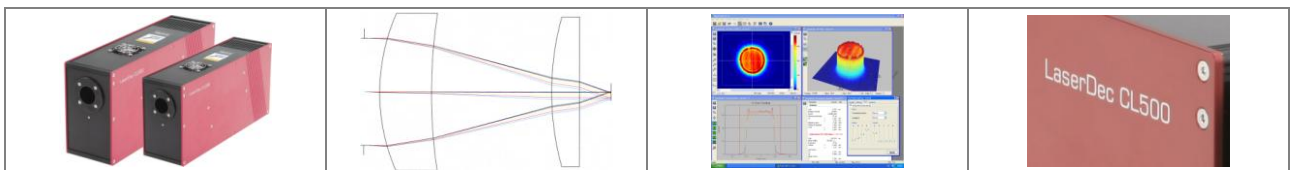
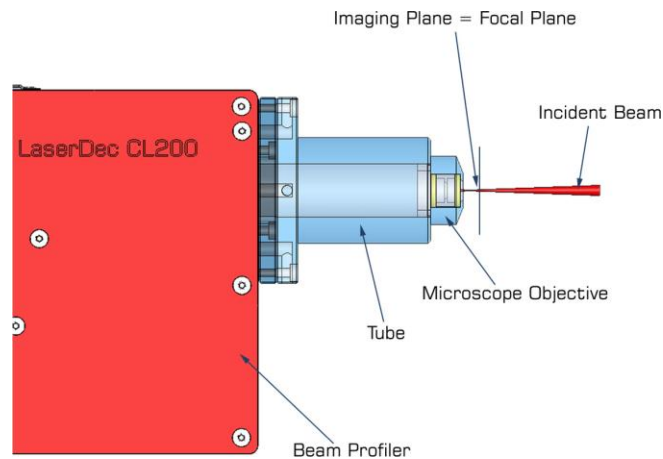
**NEW**  
**IR Microscope Objective**  
**- Technical Data -**

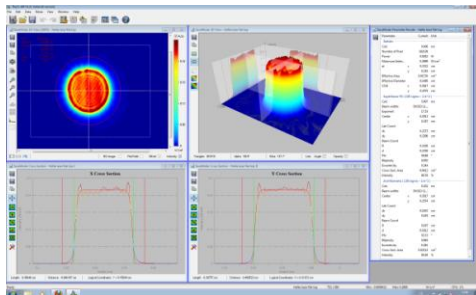
The IR objective is an add-on to the standard LaserDec CL Beam Profiler. It is based on zinc selenide (ZnSe) and can be mounted on the LaserDec aperture. This special designed objective is optimized for focus spot measurements in the range of 10µm - 400µm up to 150W laser power. The focal plane is imaged with 40x magnification to the effective area of the LaserDec CL Beam Profiler.

**OB-IR-01**

Magnification :	40x
Numerical aperture:	0.23
Focus size max:	250µm @ CL200 / CL200 HP
Focus size max:	400µm @ CL500 / CL500 HP
Resolution:	<10µm
Power (P <sub>max</sub> ):	150W

Design and specification of the described product(s) are subject to change without notice.





## RayCi - Product Description -

CINOGY's sophisticated beam profilers are available with the specifically designed analysis software, RayCi, which supports XP / Vista / Windows 7 operating systems. It is available as 32 Bit / 64 Bit version and can control several beam profiler cameras on a single computer simultaneously.

Due to its clearly designed menu structure, RayCi shows self-explanatory functions, which help the user to access quickly standard settings. Incomparable visualization modes, extensive analytical capabilities as well as new developed correction algorithms ensure the highest accuracy in laser beam analysis.

A wide range of beam width techniques e.g. 2<sup>nd</sup> Moment, Knife Edge, Moving Slit, Plateau and Gauss-Fit can be applied to determine quick and reliable standard beam parameters. The unique measurement tool enables the continuous monitoring of beam parameters, beam position and power density distribution. Moreover a new beam quality  $M^2$  tool enables accurate beam propagation analysis.

Helpful features like AOI Tracking, AOI Optimization, Zoom Functions, Look-Up Tables, etc. simplify the laser beam analysis.

The extraordinary graphical and analytical tool of RayCi can be used for live data (LiveMode) and stored data (SaveMode) simultaneously, while each mode has its own individual functions. This makes RayCi the most advanced analysis software on the market.

RayCi is equipped with flexible data and image output capabilities. This permits the user to store data and images in the format that is compatible with their needs.

A clearly arranged and printable protocol view displays the chosen measurement parameters as well as the most important laser beam analysis results.

RayCi is compatible with guidelines of the international standard organization for laser beam measurements:

- ISO 11145: Vocabularies and symbols
- ISO 11146: Beam width, propagation ratio,...
- ISO 11670: Beam positional stability,...
- ISO 11554: Beam power, energy,...
- ISO 13694: Beam power density distribution,...

RayCi works only with a USB software protection lock. It is a hardware based security solution to protect and encrypt the software against piracy.

### MINIMUM SYSTEM REQUIREMENTS

- XP / Vista / Windows 7
- Pentium IV / AMD Processor
- 128 MB graphic card, Open GL V1.4 compatible
- 100 MB free memory
- PCI / PCIe slot for FireWire card
- USB port for dongle connection
- CD / DVD-ROM drive for software installation
- Internet access for update request

