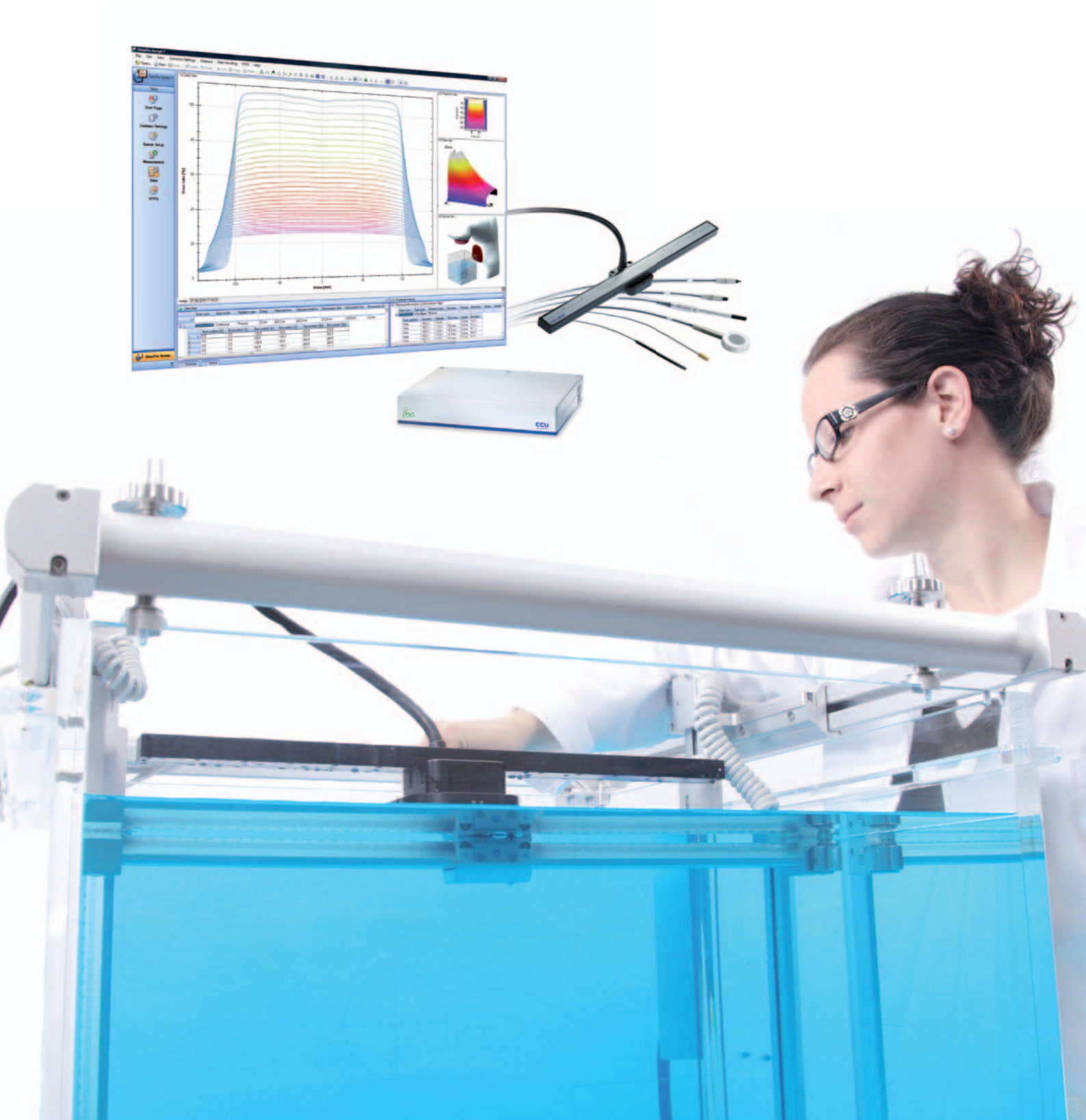


Blue Phantom² with OmniPro-Accept (V7)

Iba

Fastest, Most Accurate and Most Reliable
Solution for Relative Dosimetry



Relative Dosimetry – Fastest, most Accurate and most Reliable

For over 30 years IBA Dosimetry has been providing the highest quality dosimetry equipment to more than 10.000 satisfied customers worldwide. The new Blue Phantom² embodies decades of expertise, research and experience in the development of water phantom systems.

Maximum flexibility for a wide range of use and budget!

The Blue Phantom² is the only water phantom which can be customized to the required specifications to gain maximum efficiency and accuracy. The physicist can select among various premium value adding features and consequently the system can be configured to the individual needs.



” Looking at this new series of the *Blue Phantom*, I am happy to see a continuous and significant progress in accuracy, flexibility, long term mechanical stability and reliability since Wellhofer Dosimetry started developing and producing water phantoms 35 years ago. Take advantage of experience, knowhow and consequent innovation by having a *Blue Phantom*². ”

Manfred Wellhöfer, Predecessor of IBA Dosimetry

The gold standard redefined – Blue Phantom²

Highest positioning accuracy

The mechanics of the Blue Phantom² tank is equipped with the high-precision magnetostrictive sensor technology. The superior magnetostrictive sensor is a non contact linear, absolute position sensor that enables the highest detector positioning accuracy.

Optimized efficiency of measurements

The Blue Phantom² retains both step-by-step and the unique and advanced continuous scanning mode. The continuous scanning mode ensures the shortest measuring time combined with a high spatial resolution.

Fastest and most accurate set-up

The micro-leveling technology allows for fast and extremely accurate horizontal alignment of the system to the water surface. Visual checks provide highest confidence in set-up accuracy.



Budgets may differ. Customize to your needs, without compromising on quality

The Blue Phantom² can be uniquely ordered with individually selected options designed to save time and increase accuracy and flexibility.

Maximum efficiency

Instant measurement of entire profiles

- 3 secs for 2,5 mm pitch (198 data points)

Micro-leveling frame

- For fast and accurate horizontal alignment of the scanning mechanism

Unique continuous scanning

- Fastest scanning with highest sampling time
- Full profile scanned in 8 seconds with 1 mm resolution

Slanted bottom

- For complete drain of the tank without manual lifting

Maximum accuracy

Scan optimization module

- Pre-defined regions combine most optimal scan measurements with the highest number of data points

Automatic Kt,p correction

- Built-in pressure and temperature sensors prepared for automatic Kt,p correction for output factor determination or Absolute Dosimetry

CAX Correction

- Central axis correction via automated measurement routine

Maximum flexibility

Software controlled CCU

- Selectable input: floated and grounded, to use with all commonly used detectors

Wedge check module

- Wedge factor determination
- Wedge angle determination

Output factor table

- Output factor determination module

TMR-set

- Measurement of TMR depth dose curve in continuous mode with real-time display of dose versus water level

Thin Window

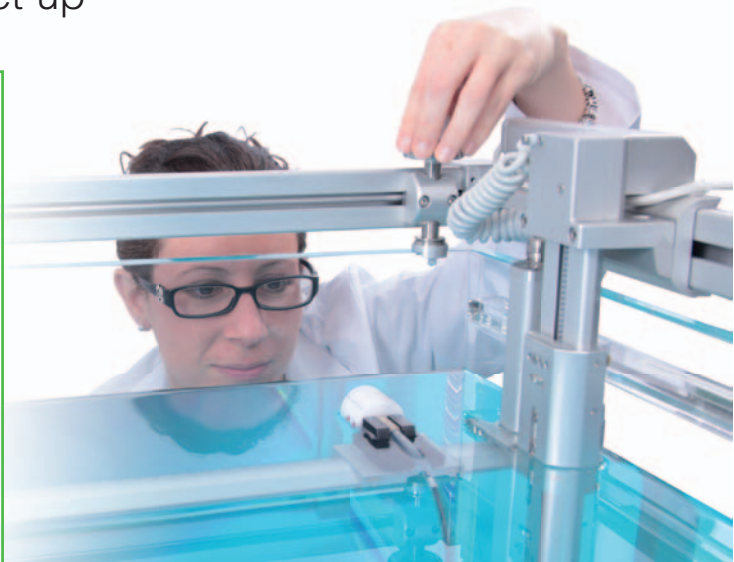
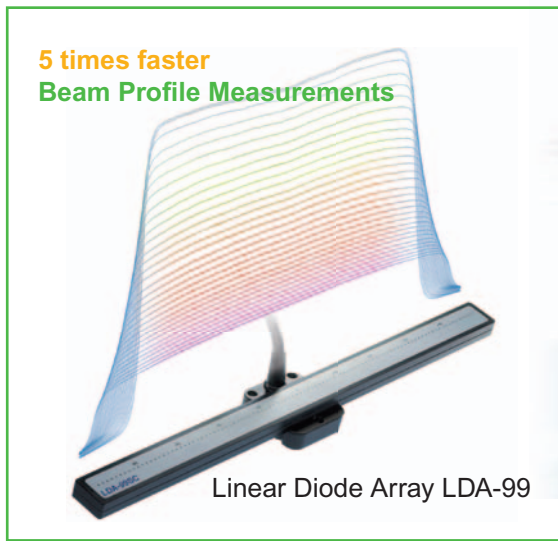
- Milled in one side of the wall to allow horizontal irradiations through only 3 mm PMMA

” I have been using IBA's Blue Phantom and the innovative linear diode array during the commissioning of my Trilogy and Novalis TX Linacs. The capability to acquire profiles instantly, allowed me to collect all beam data in a fraction of the time. The speed of the LDA99 versus a single detector is unmatched in the industry. ”

R. Rodebaugh, Ph.D.; Chesapeake General Hospital, Chesapeake, VA

Efficient and accurate Linac commissioning and QA. Our common focus, your peace of mind

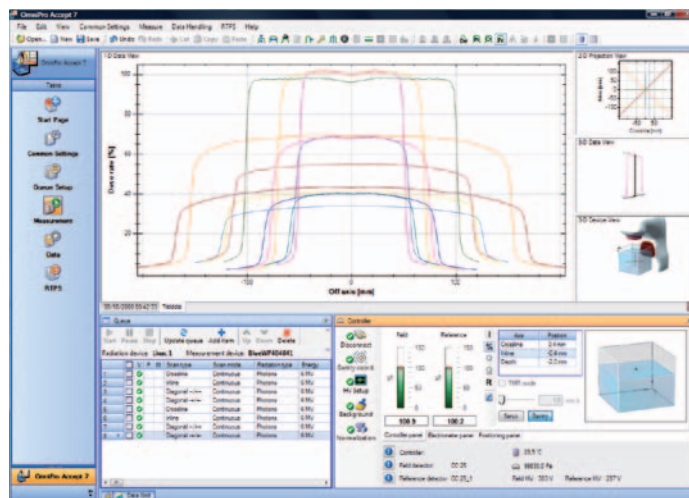
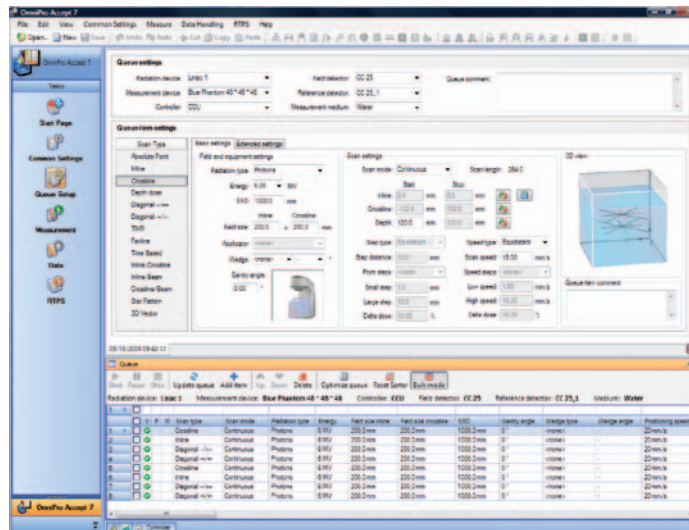
Fastest and most accurate set-up



- ▶ **Modular design:** Customizable solution to fit all measurement requirements from large field to small field Linacs and to fit any specific requirement of any department
- ▶ **CCU:** Its compact design combines a controller and two independent integrated electrometers for simultaneous support of diodes and ionization chambers and can be placed inside the treatment room for more convenience. Built-in pressure and temperature sensor interfaces prepared for automatic Kt,p correction for Absolute Dosimetry
- ▶ **Single hand pendant increases efficiency** for easy and intuitive control of the Blue Phantom² mechanics and water reservoir
- ▶ Interactive **micro-leveling** system for most efficient set-up of the phantoms
- ▶ Linear Diode Array – **Instant measurement of entire profiles:** 3 secs for 2,5 mm pitch (198 data points)
 - Measure an entire profile instantly
 - Dramatically shorten commissioning and annual QA
 - Increase linac uptime and patient throughput
 - Consistent high accuracy measurements

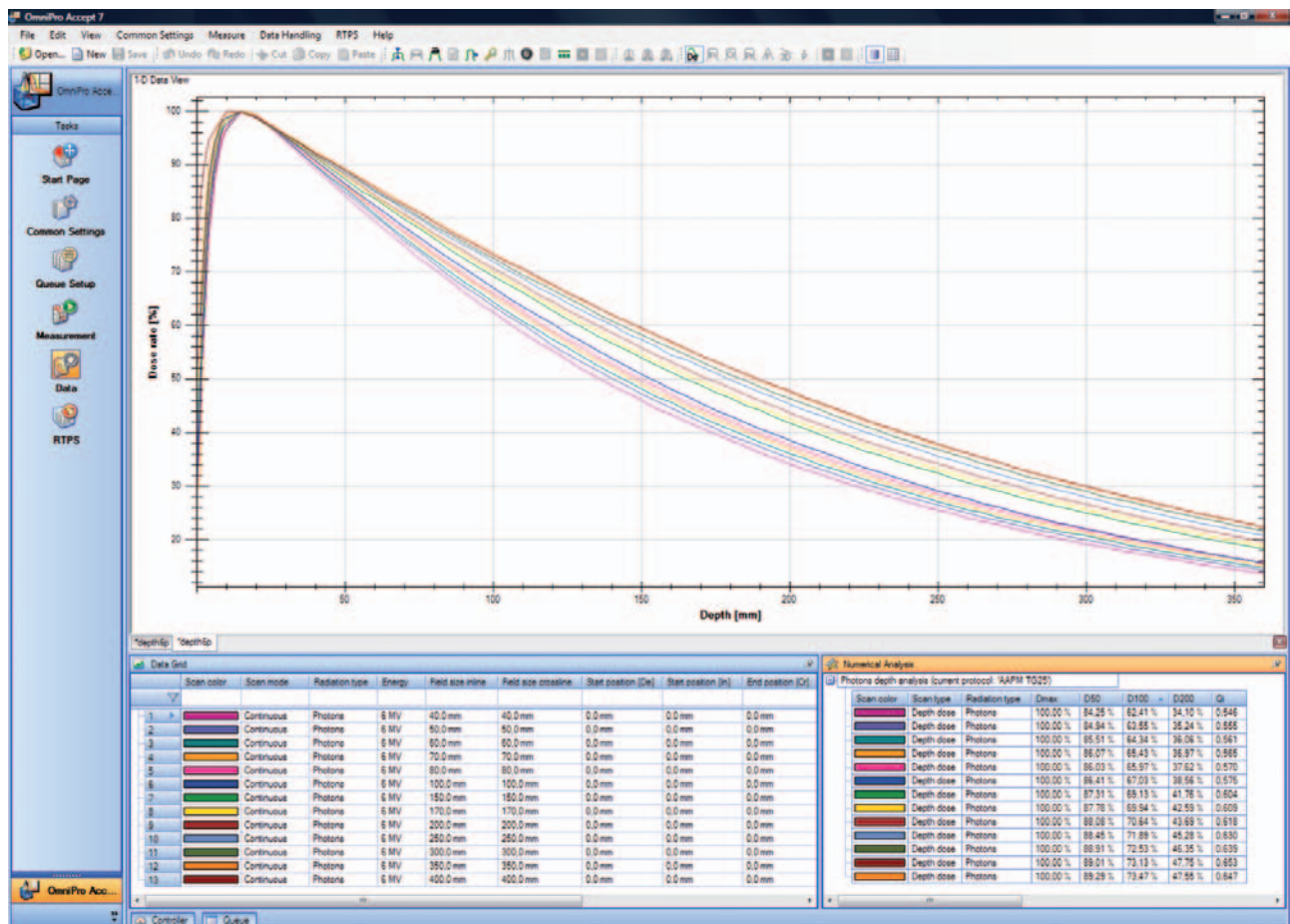
True workflow efficiency

Queue set-up & data acquisition



- Fast queue generation for customized measurement scan sequences
- Sorting, prioritizing and multiple edit of scan queues to maximize efficiency
- Adjustable scanning parameters for optimized measurements
- 1D, 2D and 3D graphical and geometrical visualization of detector position during scanning

Data analysis and processing



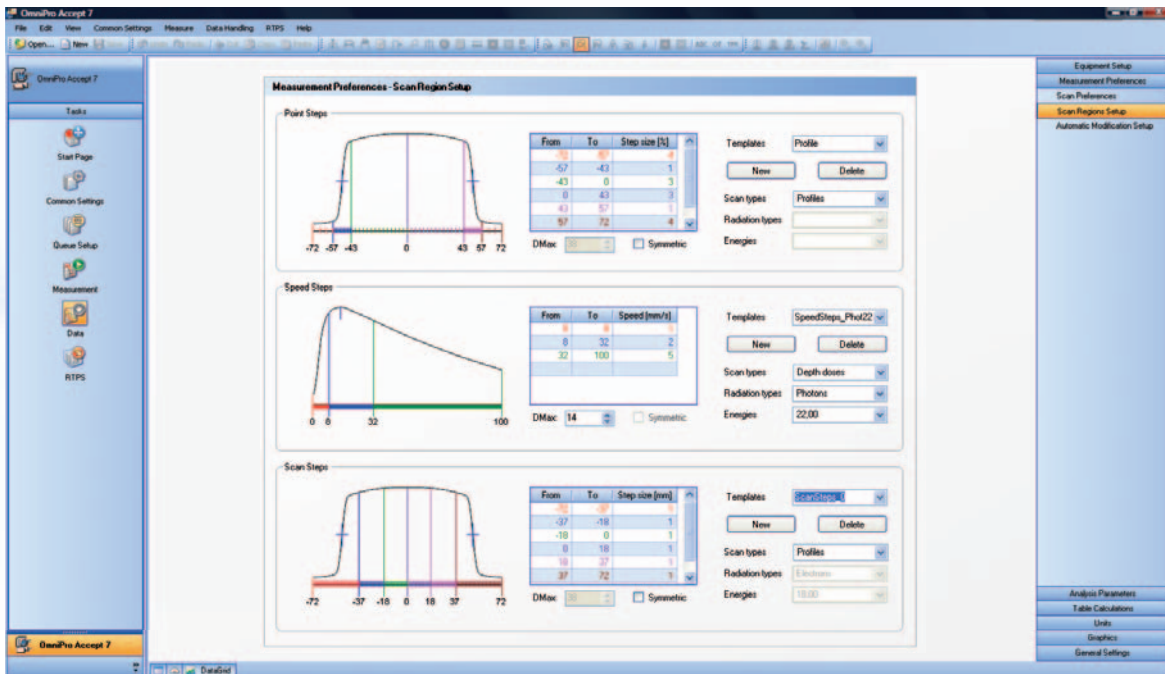
- Accurate analysis of the measured data via the use of selectable clinical dosimetry protocols
- Overlaying profiles for quantitative comparison
- 2D array and isodose calculation and display
- Library of mathematical smoothing and interpolation functions

The difference between good and excellent software? You will feel it when you use it: OmniPro-Accept

Fully workflow oriented OmniPro-Accept software to increase efficiency and reduce the commissioning and QA time of the Linac.



Scan optimization

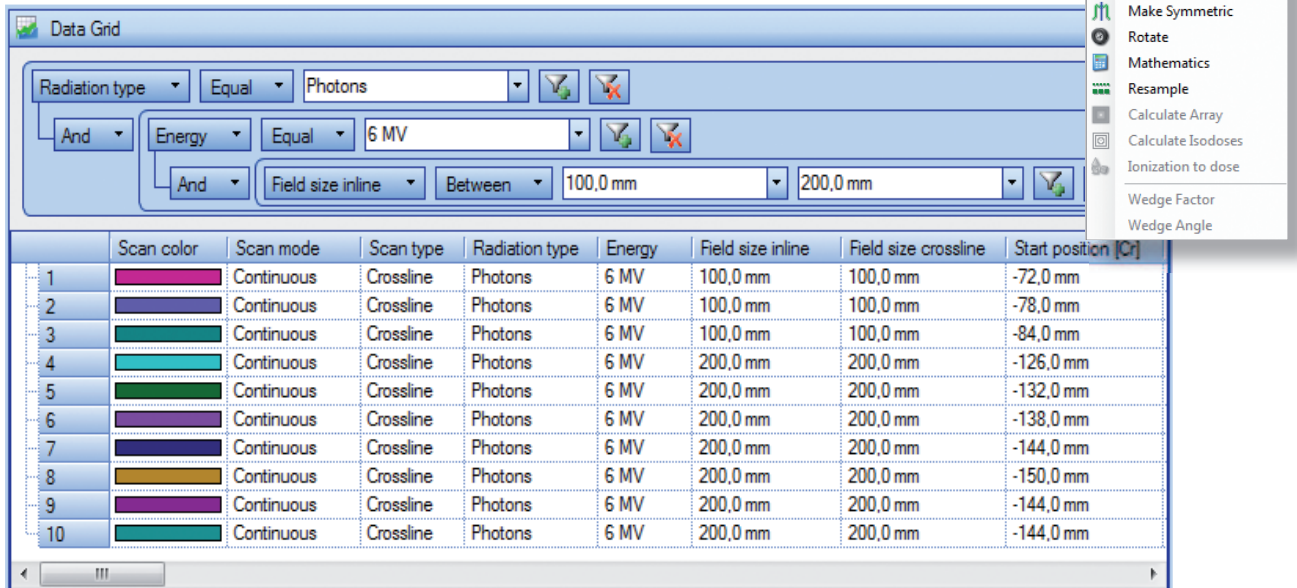


- The user can select different scan speeds or data point densities in different regions of the scan, thus optimizing the overall measurement

Automatic queue generation

- Predefined queues are available for all major TPS systems, making the data acquisition process fast and automatic

Data handling



The screenshot shows the 'Data Grid' window with a table of scan parameters and a menu of data handling options. The table has the following columns: Scan color, Scan mode, Scan type, Radiation type, Energy, Field size inline, Field size crossline, and Start position [Cr].

	Scan color	Scan mode	Scan type	Radiation type	Energy	Field size inline	Field size crossline	Start position [Cr]
1		Continuous	Crossline	Photons	6 MV	100,0 mm	100,0 mm	-72,0 mm
2		Continuous	Crossline	Photons	6 MV	100,0 mm	100,0 mm	-78,0 mm
3		Continuous	Crossline	Photons	6 MV	100,0 mm	100,0 mm	-84,0 mm
4		Continuous	Crossline	Photons	6 MV	200,0 mm	200,0 mm	-126,0 mm
5		Continuous	Crossline	Photons	6 MV	200,0 mm	200,0 mm	-132,0 mm
6		Continuous	Crossline	Photons	6 MV	200,0 mm	200,0 mm	-138,0 mm
7		Continuous	Crossline	Photons	6 MV	200,0 mm	200,0 mm	-144,0 mm
8		Continuous	Crossline	Photons	6 MV	200,0 mm	200,0 mm	-150,0 mm
9		Continuous	Crossline	Photons	6 MV	200,0 mm	200,0 mm	-144,0 mm
10		Continuous	Crossline	Photons	6 MV	200,0 mm	200,0 mm	-144,0 mm

The menu on the right includes: Rescale, CAX Correction, Smooth, Edit, Move, Mirror, Make Symmetric, Rotate, Mathematics, Resample, Calculate Array, Calculate Isodoses, Ionization to dose, Wedge Factor, and Wedge Angle.

- Easy filtering and sorting
- Easy creation and export of data tables (PDD, TMR, OAR, etc.)
- Cut and paste to Windows® applications
- Exchange data with other IBA Dosimetry applications e.g. OmniPro-I'mRT, OmniPro-Advance

Measurement modules

- Output factor determination
- Central axis correction via automated measurement routine

Advanced scanning mode

- Step-by-step scanning
- Continuous scanning: This unique scanning mode ensures the shortest measuring time combined with a high spatial resolution

Experience the difference

Our variety of detectors increases. To surpass accuracy, to treat your patient right



IBA Dosimetry offers a complete range of detectors, including ionization chambers and semiconductor detectors. All chambers as well as detectors can be mounted flexibly in vertical and horizontal orientation with our universal holders. The detectors are calibrated in our Calibration Laboratory, accredited by DKD and member of the IAEA/WHO SSDL Network.

The highest spatial resolution linear diode array on the market:

The multi-detector array LDA-99SC is designed to be used in the Blue Phantom² with 99 high spatial resolution *p*-type semiconductor detectors, suitable for electrons and photons. With a single measurement, the LDA-99SC linear array captures 99 data points at 5 mm intervals. Computer controlled longitudinal movement by user-defined distance increases the resolution up to 0.5 mm.

Main applications:

- Measurement of all profiles for commissioning with tremendous gain of time
- Automatic and accurate measurement of dynamic wedges
- Wedge angle measurement and calculation according to IEC and ICRU protocols
- In-water and in-air measurements



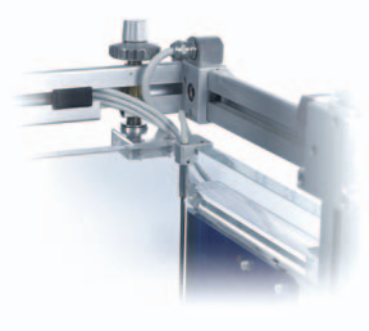
Accessories to complete your system

TMR-set: For online measurement of tissue maximum ratio (TMR) with fixed source detector distance. The TMR probe is built with our high accuracy magnetostrictive positioning technology to accurately measure the changing water level. The TMR depth dose curve is measured in continuous mode with real-time display of dose versus water level.

Water reservoir: Separate tank trolley on wheels with a polyethylene water reservoir and a pump for uni-directional or bi-directional water transport to and from the water phantom. Prepared with an electronic pump control for TMR/TPR measurement (option).

Lift table: Separate water phantom carriage with manually or electrically (telescopic) operated lifting mechanism for the positioning of the water phantom. The carriage has two fixed and two steerable rollers with brakes, as well as one compartment and two drawers for storing accessories. Equipped with a levelling frame for fine adjustment in vertical and horizontal (only electrical version) directions.

Temperature sensor: The sensor is set up inside the water tank thanks to a dedicated holder and is intended for measurement of the water temperature within $\pm 0.3^\circ \text{C}$. The water temperature measurement is used in combination with the pressure measurement (built-in pressure sensor provided in the CCU) to allow an automatic $K_{t,p}$ correction for output factor determination or Absolute Dosimetry.



Reliability you can count on:

Water Tank

Exterior water tank dimensions (LxWxH):	675 mm x 645 mm x 560 mm
Scanning volume (LxWxH):	480 mm x 480 mm x 410 mm
Position resolution:	0.1 mm
Position accuracy:	± 0.1 mm
Position reproducibility:	± 0.1 mm
Scanning speed:	max. 50 mm/s
Approximate volume:	200 l
Wall thickness / material:	15 mm / acrylic
Weight:	45 kg

Common Control Unit (CCU)

Maximum resolution:	0.5 fA at 0.4 nA full scale; 5 fA at 40 nA full scale; 0.5 pA at 4 uA full scale
Full scale range:	0.4 nA / 40 nA / 4uA
Leakage current:	typically <1 fA
Time constant:	20 ms
Bias voltage range:	± 50 through ± 500 V
Trigger interface:	RS 485 (custom specific)
Common interface:	ETHERNET (100BaseT)
Main supply:	100 – 240 V AC ± 10 %; 50/60 Hz

LDA-99SC

Number of diodes:	99
Diode spacing:	5 mm (center-to-center)
Diode specifications	
Type of silicon:	Hi-pSi diode detectors
Chip size:	2.45 mm x 2.45 mm
Diameter of active area:	2.0 mm
Sensitivity:	35 gy/nC
Effective measurement point:	<1 mm
Positioning in phantom:	0, 45, 90 and 135 degrees

Water Reservoirs HA05 / HA06

Pump direction:	bi-directional / uni-directional
Tank volume:	220 l
Flow control:	20 l/min
Dimensions (LxWxH):	970 mm x 660 mm x 830 mm
Weight (empty):	70 k

Lift Tables HA01 / HA03

Operation:	manual / electric
Vertical range:	660 - 1020 mm / 660 - 1160 mm
Vertical adjustable range (tilt):	± 15 mm / 20 mm
Horizontal adjustable range:	- 15 mm in X/Y direction
Rotation in XY plane:	n.a. / ± 5°
Table size:	635 mm x 635 mm / 680 mm x 680 mm
Dimensions (LxWxH):	790 mm x 630 mm x 660 mm / 840 mm x 680 mm x 660 mm
Weight (empty):	69 kg / 116 kg

TMR Set (requires Water Reservoir HA05)

Scan length:	30 cm
Position reproducibility:	± 0.3 mm
Filling / draining speed:	50 mm / min

emXX

Number of channels:	99+1
Measurement mode:	dose, dose rate (incl. real-time), simultaneous measurements of all channels
Characteristics (Dose/Dose rate)	
Input range:	0 nA to 500 nA
Accuracy:	± 1 % for currents > 10 pA
Resolution:	100 fC (for charge values up to 0.2 mC)
A/D converter:	120 simultaneous working A/D converters
Dimensions (LxWxH):	320 mm x 265 mm x 70 mm
Weight:	3.75 kg

Minimum Computer Requirements

Operating system:	Windows® XP Professional, Service Pack 2, 32 bit, Windows® Vista™ Ultimate Edition, 32 bit, Windows® 7 Enterprise, 32 bit and 64 bit, US-English versions only
OS language:	US English
Processor:	Dual Core (or equivalent), 2 GHz or better
RAM:	2 GB of RAM
Graphics card:	DirectX 9c compatible, 256 MB video RAM, no shared memory
Screen resolution:	minimum 1280x1024 with 32 bit color
Network:	Ethernet (RJ-45) connection to connect controllers (e.g. the CCU)
Interface:	available USB 2.0 interface to connect external devices
Free space on harddisk:	minimum 300 MB free disk space before installation and 80 MB after installation: For archiving of data, much more disk space is needed
Mouse:	any Microsoft® compatible mouse

Technical data is subject to change without prior notice.

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